Mine Safety Orders

issued by the

Industrial Accident Commission

of the

State of California

[illegible]

[illegible]

EFFECTIVE JANUARY 1, 1951

Class IN295
Book .C3
1921

Mine Safety Orders

21-27015

Issued by the

Industrial Accident Commission

of the

State of California

36
1921

525 Market Street, San Francisco
Union League Building, Los Angeles

EFFECTIVE JANUARY 1, 1921

California State Printing Office
J. M. Cremin, Superintendent
Sacramento, 1920

6163

TN295
.C3
1921

INDUSTRIAL ACCIDENT COMMISSION
OF THE STATE OF CALIFORNIA

525 Market Street, San Francisco
423 Union League Building, Los Angeles

WILL J. FRENCH, Chairman;
A. J. PILLSBURY,
A. H. NAFTZGER,
Commissioners.

H. M. WOLFLIN,
Superintendent of Safety.

LIBRARY OF CONGRESS
RECEIVED
JAN 11 1921
DOCUMENTS DIVISION

G.F. # 3/9/21

MINE SAFETY ORDERS.

PREFACE.

Sections 33 to 54, inclusive, of the Workmen's Compensation, Insurance and Safety Act give the Industrial Accident Commission power to make and enforce safety orders, rules and regulations, to prescribe safety devices, to fix safety standards, and to order the reporting of injuries.

The Mine Safety Rules, effective January 1, 1916, were adopted by the Industrial Accident Commission during the year 1915. Prior to the adoption of the rules the committee held a number of meetings and drafted Mine Safety Rules. The commission then adopted these rules after holding two public hearings.

The rules were drafted by the following committee:

Representing California Metal Producers' Association—

A. P. Anderson, Pacific Coast manager, United States Smelting, Refining and Mining Company.
(G. W. Metcalf, manager Mammoth Copper Company, alternate to Mr. Anderson.)
N. S. Kelsey, manager Argonaut Mining Company.
Arthur B. Foote, superintendent The North Star Mines.

Representing Mine Employees—

James Giambruno, secretary Amador County Miners' Union No. 135.
J. C. Williams, secretary Grass Valley Miners' Union No. 90.
A. M. Arandall, secretary Randsburg Miners' Union No. 44.

Representing Industrial Accident Commission—

H. M. Wolflin, mining engineer, United States Bureau of Mines.

In 1920 the commission requested various interests to serve on a committee to revise the mine safety rules, now designated as mine safety orders.

The orders were revised on March 22, 23, 1920, by the following committee:

A. P. Busey, Jr. (chairman), manager Penn Mining Company

G. Chester Brown (secretary), Chief Mining Engineer, Industrial Accident Commission.

N. S. Kelsey, general manager Argonaut Mining Company.

Arthur B. Foote, superintendent The North Star Mines.

C. G. Dennis, manager St. Johns Mines Company.

Edwin Higgins, mining engineer, The Metals Exploration Company.

C. H. Fry, engineer California Metal and Mineral Producers Association.

Philip Oates, secretary Mine Workers Protective League.

Sid Rich, president Local Union No. 45, International Union of Mine, Mill and Smelter Workers.

(W. J. Patrick, Local Union No. 45, International Union of Mine, Mill and Smelter Workers, alternate to Mr. Rich.)

R. W. Rodda, Empire Safety Bear Club.

H. M. Wolflin, Superintendent of Safety, Industrial Accident Commission.

A public hearing was held on August 17, 1920, at which time the proposed Mine Safety Orders were discussed in detail and a few of the orders referred back to the committee to be redrafted. The committee met on September 17, 1920, and redrafted the orders that had been referred back to it.

At a meeting of the Industrial Accident Commission, the Mine Safety Orders were adopted, to become effective on January 1, 1921.

MINE SAFETY ORDERS.

Order 1700. **Definitions.**

(*a*) *Application.*—These orders shall apply to all mines operated in the State of California; *provided,* that in cases where, in the opinion of the Industrial Accident Commission, the enforcement of any order would not materially increase the safety of employees, and would work undue hardship on the operator, exemptions may be made at the discretion of said Commission, but such exemptions must be in writing to be effective, and can be revoked after reasonable notice is given in writing; *provided, further,* that the orders shall not apply to the operation of mines employing three men or less on one shift, or to gold dredges, hydraulic mining operations, or surface placer mining, except where the orders specifically provide for the inclusion of these classes of mining in their provisions.

(*b*) *Singular and plural numbers.*—For the purposes of these orders, the singular number when used in reference to persons, acts, objects, and things of whatsoever kind and description shall, whenever the context will permit, be taken and held to import and include the plural number, and the plural number shall similarly be taken and held to import and include the singular.

(*c*) *Mine.*—The term "mine" shall include prospect openings, pits, banks, and opencut workings, and shall

embrace any and all parts of the property of such "mine" and mining plant, on the surface or underground, that contribute directly or indirectly to the mining or handling of *minerals; provided,* that when a group of workings in proximity to one another and under one management are administered as distinct units, each working shall be considered a separate mine.

(*d*) *Mineral.*—The term "mineral" shall mean whatever is recognized by the standard authorities as mineral, whether metalliferous or nonmetalliferous, but shall not be held to embrace or include coal, lignite, gas, oil, or any substances when extracted in solution through bore holes.

(*e*) *Operator.*—The term "operator" shall mean the person, firm, or body corporate in immediate possession of any mine and its accessories as owner or lessee thereof, and as such responsible for the condition and management thereof.

(*f*) *Superintendent.*—The term "superintendent" shall mean the person having the immediate supervision of the mine.

(*g*) *Mine foreman.*—The term "mine foreman" shall mean a person who at any one time is charged with the general direction of the underground work.

(*h*) *Chief mining engineer.*—The term "chief mining engineer" shall signify the mining engineer employed by the California Industrial Accident Commission to have charge of the mine safety work.

(*i*) *Mining engineer.*—The term "mining engineer" shall mean one of the mining engineers of the California Industrial Accident Commission.

(*j*) *Excavations or workings.*—The words "excavations" and "workings" shall signify any or all parts of a mine excavated or being excavated, including shafts, tunnels, entries, galleries, open cuts, and all working places, whether abandoned or in use.

(*k*) *Number of men.*—Whenever the expressions "number of men" or "average number of men" employed in a mine are used, as defining or constituting classes of mines to which these orders, or any specific section, clause, or provision thereof, does or does not apply, such expressions shall be construed to mean the average number of men employed during the previous calendar month, as shown by the returns to the chief mining engineer or by the books or pay roll of the mine, or by all of such means, and such average number shall be determined by dividing the total number of man shifts by the number of days the mine is worked during such period.

(*l*) *Explosive.*—The term "explosive" or "explosives" shall be held to mean and to include any chemical compound or any mechanical mixture that contains any oxidizing and combustible units or other ingredients in such proportions, quantities, or packing that an ignition by fire, by friction, by concussion, by percussion, or by detonator, of any part of the compound or mixture may cause such a sudden generation of

highly heated gases that the resultant gaseous pressures are capable of producing destructive effects on contiguous objects or of destroying life and limb.

(*m*) *Person.*—The term "person" shall be held to mean and include a firm or body corporate as well as natural persons.

(*n*) *Underground.*—The term "underground" shall be held to mean "within the limits of" any mine working or excavation and shall not exclude such workings or excavations as may not be covered over by rock or earth.

(*o*) *Employees.*—The terms "employees" and "men employed" shall be held to mean all men receiving compensation from the operator, directly or indirectly, for labor or services performed in connection with the mine and shall include contractors, leasers, tributers, or any one else similarly employed.

Order 1701. Reports to Chief Mining Engineer.

Number of men employed, tonnage produced, condition of safety devices, etc., to be reported yearly.

(*a*) It is hereby made the duty of the operator of each and every mine within the state coming within the provisions of these orders, to forward to the chief mining engineer at his office not later than the 20th day of April of each year, a detailed report in writing on a form supplied by the Commission, showing the character of the mine, tonnage of product during the previous year ended December 31st, the average number of men therein employed during the year, and the number of days the mine was worked. Other information relative to the workings, equipment, ventilation, sanitation,

means of ingress and egress, shafts, supports, safety devices, storage of explosives, and means taken to protect lives and insure safety to men in relation to any of the requirements of these orders shall be given to the Industrial Accident Commission from time to time as required. All such reports shall be filed in and become part of the records of the office of the Industrial Accident Commission. Blank forms for such reports shall be furnished by the Commission; *provided, however,* that in the case of any mine being operated for less than one year prior to December 31st in any year, the operator in such event shall forward a report, in like manner, covering the period during which said mine was operated; *and provided, further,* that in the event of the sale or lease of any mine during any year prior to December 31st, then and in that event it shall be the duty of the owner or operator so selling, leasing, or turning over such mine to a succeeding operator to supply to such succeeding operator a like report, as required in this section, covering the period of such former operations within said year; and it shall then and in that event become the duty of such succeeding operator to forward such report so turned over, together with said succeeding operator's report, for the period of said succeeding operator's operations, to the chief mining engineer as aforesaid not later than the 20th day of April in each year.

Reports from mines operated less than a year.

Reports, how made when mine changes management.

(*b*) *In all cases, occurring in or about any mine, of fires, threatening or causing injury to men or mine workings, appearance of dangerous gas, breakage of ropes or other gear by which men are hoisted or lowered, overwinding while men are being hoisted, unexpected serious inrush of water, threatened crushing of*

Dangerous conditions to be immediately reported to chief mining engineer by mine operator.

mine workings, or any other accident, occurrence, or change of conditions tending materially to increase the hazards of mining, whether or not personal injury results, a report thereof, signed by the operator or superintendent shall immediately be sent in writing to the chief mining engineer.

(*c*) Every operator of a mining property upon resuming or starting new operations, shall send a notice to the chief mining engineer, giving the location of the mining property, name of the superintendent, operating company, number of men employed on the surface and number of men employed underground.

Order 1702. **Designation for Service of Notices.**

Operator to appoint person on whom notices may be served.

(*a*) Every operator of any mine within the provisions of these orders shall, within sixty days after the approval of the orders by the Commission, file or cause to be filed in the office of the chief mining engineer of the Commission a designation, duly verified by such operator, appointing a person on whom all notices, warnings, or processes required to be served under the provisions of these orders may be served, and giving the office, place of employment, or place of business of such person, which must be within the state.

Designation to continue in force until revoked.

(*b*) Such designation shall continue in force until revoked by the death or removal of the person so designated, or until revoked by an instrument in writing designating in like manner some other person upon whom such notices or processes may be served, or until the filing in such office of a written revocation of said

consent executed by the person so designated. If the person so designated dies, or removes from the state, or files a revocation of his consent, the operator shall designate, within thirty days thereafter, in like manner some other person upon whom such notices or processes may be served within this state.

Operators or agents may be so designated.

(*c*) Services on such designated person of notices, warnings, or processes shall, in all cases arising under these orders, be deemed service on the operator represented; *provided, further,* that nothing herein contained shall be construed to prevent the said operator in person, or by its officers or agents, if said operator be a corporation, or any employee of such operator, from being so designated.

Order 1703. **Care of the Injured.**

Stretchers and first-aid materials are to be kept at various places in and about mines.

(*a*) It shall be the duty of operators, superintendents, or any one in charge of any mine, to keep at such places about the mine as may be designated by the chief mining engineer, a Homestake or Stokes Navy stretcher, a woolen blanket, a water-proof blanket, and such first-aid materials, as may be designated in subsequent portions of these orders, in good condition for use in caring for any person who may be injured at the mine.

First-aid corps required at mines.

At all mines and metallurgical plants, not less than two per cent of the employees shall receive first-aid training. In addition thereto all bosses shall receive first-aid training. On and after January 1, 1922, at least ten per cent of the employees shall receive first-aid training. First-aid corps shall consist of the foreman

or foremen, shift bosses, and other employees designated by the superintendent; and it shall be the duty of the operator or superintendent of the mine to cause the organization of such employees and to provide for the instruction of the members of such first-aid corps from time to time, not less than once in each calendar month, in the proper handling and treatment of injured persons before the arrival of a physician.

Such instruction may be given by a physician or by any competent first-aid instructor, who has a first-aid certificate issued by the U. S. Bureau of Mines or the American Red Cross. The holders of such certificates who are training men shall be examined yearly as to their competency.

(*b*) The aforementioned first-aid materials for use at the various stations where stretchers are kept shall consist of least twelve triangular bandages, six first-aid compresses, three packets of picric acid gauze, (one yard square), one two-ounce bottle of aromatic spirits of ammonia, one two-ounce bottle of iodine not stronger than ¼ U.S.P., one tourniquet, one-half dozen paper drinking cups, one pair of forceps, twelve roller bandages (one-half, one, one and one-half, two and three inches). Also a complete set of splints as given below:

1. 1 splint, 4 inches wide by 10 inches long by ¼ inch thick.
   1 splint, 4 inches wide by 12 inches long by ¼ inch thick.
   (To be used for a fracture of the arm or hand.)
2. 1 splint, 4 inches wide by 16 inches long by ¼ inch thick.
   1 splint, 4 inches wide by 15 inches long by ¼ inch thick.
   (To be used for a fracture of the forearm, elbow or foot.)

3. 1 splint, 4 inches wide by 55 inches long by ½ inch thick. (To be used for a fracture of the thigh.)
4. 3 splints, 4 inches wide by 33 inches long by ½ inch thick. (To be used for a fracture of the knee cap and leg, and with the above makes up the splint for a fractured thigh.)
5. 2 splints, 4 inches wide by 84 inches long by 1 inch thick.
   3 splints, 4 inches wide by 15 inches long by 1 inch thick. (To be used for a broken back, dislocation of the hip and fracture of the pelvis.)

At least three triangular bandages and three compresses shall be kept on each working level. It shall be the duty of the mine superintendent to see that used or opened packets are immediately replaced. It is recommended that each boss carry a water-proof tin packet containing a triangular bandage and a compress.

Order 1704. **Oxygen Mine Rescue Apparatus.**

(*a*) The operator or superintendent of every mine employing more than fifty men underground on one shift, shall provide and keep in a readily accessible place, at least five sets of oxygen mine rescue apparatus, to be used in case of emergency; *provided,* that the Industrial Accident Commission may require the maintenance of five such sets of mine rescue equipment at a mine employing less than fifty men underground on one shift, when the ventilation or the fire hazard at such mine may, in the opinion of the Commission, justify this protection. Aforesaid apparatus shall be of a type approved by the Industrial Accident Commission. Nothing in this section shall be construed to prevent the construction of a co-operative station in any district

Oxygen mine rescue apparatus required.

Co-operative mine rescue stations permitted.

where mine operators may build and maintain a station to supply apparatus for several mines; not less than five apparatus shall be kept at such station. In any case, a co-operative station shall be located at no greater distance from each mine which it supplies than can be covered by the most convenient means of transportation in one hour's time, during all seasons of the year.

Competent foreman required at a co-operative station.

(*b*) Where a co-operative station is maintained, an active, competent, trustworthy, and well trained man shall be designated as foreman to have charge of such station. Such foreman need not be exclusively so employed, but his employment shall be such that he or a substitute can be promptly notified in case of need. He shall occupy living quarters therein, or convenient thereto, and shall make reports to the Industrial Accident Commission as provided in paragraph (*f*) of this section. Each month when the required tests of the apparatus are being made at a co-operative station, a superintendent of one of the mines supplied by such station (or a competent, well trained man designated by such superintendent) shall be present, and together with the foreman, shall sign the report made to the Industrial Accident Commission. The superintendents of mines supplied by a co-operative station, or the persons designated by such superintendents, shall each take turns observing these tests and inspections, and approving the reports of the station foreman, so that it will be necessary for but one representative of the companies to be present each month.

Monthly tests of apparatus.

(*c*) Telephone communication shall be maintained between a co-operative station and each mine which it supplies. If the foreman in charge of a station does not reside thereat, his residence also shall be in telephone communication with each mine supplied by the station. Telephone communication required at co-operative stations.

(*d*) In addition to the supplies used for training of men an emergency supply of oxygen and regenerator charges sufficient to keep each apparatus running for at least ten hours shall be kept on hand, at each station—co-operative and privately owned. Any additional parts which require frequent renewals shall be kept at each station. Ten hours' supplies required for each apparatus.

(*e*) The apparatus at privately owned stations shall be inspected monthly by a competent and well trained man designated by the superintendent for this duty. At co-operative stations the inspections and tests shall be made by the foreman of the station, in the presence of a representative of one of the mines supplied by such station, as provided for in paragraph (*b*). Monthly inspections of each apparatus shall include tests for tightness of all joints, breathing bags and breathing circuit, the flow of oxygen from the reducing valve, and volume of air in circulation; for injector types, the pressure and vacuum also shall be recorded. Monthly inspections of apparatus required.

(*f*) The result of such tests and inspection shall be tabulated on a form to be furnished by the Commission, and shall be forwarded to the office of the chief mining engineer at least once a month. Results of tests must be reported to Commission.

(*g*) At each mine not less than five men shall be so instructed in the use of the oxygen mine rescue apparatus that they shall be thoroughly competent to use the same in actual service. One trained man for each apparatus required at each mine.

(*h*) The superintendent of each mine where mine rescue apparatus is kept shall cause the men who are to be trained in the use of said apparatus to be given a careful physical examination by a physician before starting such training and shall cause them to practice with the apparatus at least once each month. Said practice shall include work in a room or chamber filled with smoke or irrespirable gas for at least sixty minutes each month. Must train sixty minutes per month in smoke.

Order 1705. **Mine Maps.**

(*a*) The operator of every mine shall make or maintain, or cause to be made or maintained by a competent mining engineer or surveyor, or other person equally competent, a clear and accurate map or maps, with sections, if necessary, showing clearly all the workings of such mine. At least once in every calendar year, or oftener, if necessary, the operator or superintendent of each mine shall cause to be shown clearly and accurately on the map or maps of such mine, all the excavations made therein during the time elapsed since such excavations were last shown on such map or maps, and all parts of said mine that shall have been worked out or abandoned during said elapsed period of time shall be clearly indicated on said map or maps, and all Mine maps to be made and brought up to date yearly.

underground workings shall be surveyed and mapped before they are allowed to become inaccessible.

Mine maps to be filed in office of chief mining engineer upon abandoning mine.

(*b*) Before any mine having underground workings is abandoned, the operator of such mine shall cause to be made by a competent engineer or surveyor, a map on a smaller scale than 101 feet to the inch, showing all underground workings. A print or copy of such map, certified by the superintendent or operator, shall be filed in the office of the chief mining engineer. This map shall not be available to any person other than the Industrial Accident Commission, the chief mining engineer or mining engineers, without authorization of the owner of the property.

Order 1706. **Dangerous Mines.**

Procedure of engineers when dangerous conditions are found.

(*a*) Whenever the chief mining engineer or one of the mining engineers shall find any mine or part of any mine in an unsafe condition by reason of any violation of any of these orders, or in a condition dangerous or detrimental to the life or health of those employed therein for the same reason or by reason of defects in timbering, or other means of support, in mining, in ventilation, or in sanitation, it shall be the duty of the chief mining engineer to serve or cause to be served a notice in writing on the operator or superintendent of such mine, or on the person designated by such operator for service in accordance with order 1702 of these orders, and such notice shall set forth in detail the nature and extent of the defects that render the mine or part of the mine unsafe, dangerous or detrimental to the life or health of those employed therein,

together with the point or place in the mine or in the workings of the mine where such defects exist, and such notice shall require the necessary changes to be made in such mine or part of the mine without delay or within a specified time at the discretion of the Industrial Accident Commission.

Procedure of engineers if operators fail to follow instructions.

(*b*) If it appear from a reexamination of the mine by the chief mining engineer or a mining engineer that such necessary changes have not been made within the time specified in such notice, and that the mine or part of the mine is still in a condition of danger to life or health, and in the opinion of the mining engineer it is necessary for the safety of the life or health of the employees in such mine or part of the mine, the Industrial Accident Commission shall be notified and shall take such steps as are provided for in the Workmen's Compensation, Insurance and Safety Act.

Use of unsafe machinery, how prevented; injunction.

(*c*) Workmen's Compensation, Insurance and Safety Act, section 46½ (new). Unsafe places of employment prohibited. Use of dangerous machinery prohibited.

"SEC. 46½ (new)*. If the condition of any employment or place of employment or the operation of any machine, device or apparatus shall constitute a serious menace of the lives or safety of persons about it, the commission, or a commissioner, may apply to the superior court of the county in which such place of employment, machine, device or apparatus is situated,

---

*Chapter 586, Laws of 1917, as amended by Chapter 471, Laws of 1919.

for an injunction restraining the use or operation thereof until such condition shall be corrected. The said application accompanied by affidavit showing that such place of employment, machine, device or apparatus is being operated in violation of a general or special safety order of the commission, and that such use or operation constitutes a menace to the life or safety of any person or persons employed thereabout, accompanied by a copy of the order or orders applicable thereto shall constitute a sufficient prima facie showing to warrant, in the discretion of the court, the immediate granting of a temporary restraining order. No bond shall be required from the commission as a prerequisite to the granting of any restraining order. When in the opinion of the industrial accident commission a machine or any part thereof is in a dangerous condition or is not properly guarded or is dangerously placed, the use thereof shall be prohibited by the commission, and a notice to that effect shall be attached thereto. Such notice shall not be removed except by an authorized representative of the commission, nor until the machinery is made safe and the required safeguards or safety appliances or devices are provided, and in the meantime such unsafe or dangerous machinery shall not be used."

Prohibiting use of dangerous machine.

Notice.

Order 1707. **Report of Fatal Injuries.**

Section fifty-three of the Workmen's Compensation, Insurance and Safety Act of 1917, approved May 23, 1917, is hereby amended to read as follows:

"SEC. 53. (*a*) Every employer of labor, without any exceptions, and every insurance carrier, and every

Report of injury.

physician or surgeon who attends any injured employee, is hereby required to file with the commission, under such rules and regulations as the commission may from time to time make, a full and complete report of every injury to an employee arising out of or in the course of his employment and resulting in loss of life or injury to such person; **provided, that such report shall not be required unless disability resulting from such injury lasts through the day of the injury or requires medical service other than ordinary first-aid treatment. Where the injury results in death, a report shall be made by the employer to the commission by telephone or telegraph forthwith.** Such report shall be furnished to the commission in such form and such detail as the commission shall from time to time prescribe, and shall make specific answers to all questions required by the commission under its orders and regulations. It shall be unlawful for any person, firm, or corporation, agent or officer of a firm or corporation, to fail or refuse to comply with any of the provisions of this section, and any such person, firm, corporation, agent or officer of a firm or corporation, who fails or refuses to comply with the provisions of this section shall be guilty of a misdemeanor for each and every offense and upon conviction thereof shall be punishable by a fine of not less than ten dollars nor more than one hundred dollars * * *."

Upon receiving such notice the chief mining engineer or a mining engineer shall, if feasible and if the nature of the accident shows it to be necessary, proceed to the scene of the accident as early as possible and investigate fully the cause of the accident, and within twenty days thereafter shall file the result of such investigation as a report in the office of the chief mining engineer. Whenever the chief mining engineer or a mining engineer can not proceed as above to the scene of the accident, the person in charge of the mine shall be so informed, and such person in charge shall obtain signed statements, sworn to where practicable, of those who witnessed the accident, or if no one was present at the time of such accident he shall obtain the statements of those first arriving upon the scene. Such statements shall give, as far as possible, the details of the accident, the facts leading up to it, and its probable cause; such statements shall immediately thereafter be sent to the Industrial Accident Commission, which shall file the same in its office as public records. Blank forms for these statements shall be furnished by the Commission. A transcript of the evidence given at the coroner's inquest may be sent in in place of these statements when the mine operator so desires.

Investigation of fatal injuries to be made when necessary.

Statements of witnesses of fatal injuries to be filed with Industrial Accident Commission.

Order 1708. **Superintendent to be Appointed.**

(*a*) The operator of every mine shall appoint a man who shall be personally in charge of the mine and the performance of the work done therein, who shall be designated as the "superintendent"; *provided, however,*

Superintendent shall be appointed.

that nothing herein contained shall prevent the owner or operator of any mine from personally filling the office of superintendent.

In mines employing twenty-five men or more, no man shall be employed as superintendent who has not had three years' experience in mine work, and in mines employing less than twenty-five men no man shall be employed as superintendent who has not had at least two years' experience in mining work.

Superintendent to cause safety inspections to be made and to report to operator defects he can not immediately correct.

(*b*) The superintendent of every mine shall inspect, or cause some competent person or persons appointed by him to inspect machinery, boilers, engines, magazines, shafts, shaft houses, underground workings, roofs, pillars, timbers, explosives, bell ropes, speaking tubes, telephones, tracks, ladders, dry closets, and all parts and appliances of said mine in actual use, and any such person or persons appointed by the said superintendent shall at once report any defects therein to the superintendent. It shall be the duty of the superintendent upon ascertaining such defects, to take immediate steps to remedy the same so as to make the same comply with the provisions of these orders, and he shall forthwith notify the operator of said mine of the existence of any such defects as he may not be able to immediately correct. It shall be the duty of the superintendent to appoint a competent man to have full charge, under the direction of said superintendent, of every magazine containing explosives situated on such mining property, and to make such other appointments and perform such other duties as are provided by these orders to be performed by such superintendent.

(*c*) Weekly shaft inspection reports shall be filed in the mine office as outlined below.

WEEKLY SHAFT INSPECTION REPORT
TO BE FILED IN THE MINE OFFICE

Name of Inspector_____

Date_____

Remarks

Timbers
Guides or track
Safety gates or guard rails
Shaft clearance
Safety devices on cage
Skip or cage coupling
Hoisting ropes
Top sheave wheel
Overwinding devices
Chutes
Chute gates
Bell signal system
Telephone system
Manway
Ladders and platforms
Date hoisting rope was last cut off
Length of hoisting rope removed ____ feet; date _____

NOTE.—A cave-in in shaft or "hanging up" of cage or skip in shaft or any unusual incident must be noted on the next following weekly shaft inspection report. Give details of cause and method of correction.

(*d*) Safety committees shall be organized at all mines employing twenty-five (25) or more men. The personnel of these committees shall be selected by the superintendent of the mine. The committees shall devise ways and means to reduce the number of

accidents and to carry on safety education among the men by means of literature, posters, etc. The committees shall hold monthly meetings, keep a careful record of the proceedings at such meetings and encourage the men to make safety suggestions. All suggestions shall be acted upon by one of the committees.

Order 1709. **Mine Foreman to be Appointed.**

(*a*) The superintendent of every mine shall appoint a man who personally shall be in charge of the underground workings of the mine and personally direct the work of the men employed underground therein, who shall be designated as the "mine foreman"; *provided, however,* that nothing herein contained shall be construed to prevent the superintendent of any mine from also filling the position of mine foreman. Any person appointed to the position of mine foreman shall be at least twenty-one years of age, shall have had at least two years' practical experience underground, and shall be able readily to read and write the English language.

Qualifications of foreman.

Order 1710. **Foreman's Duties.**

Mine foreman is responsible for safety of underground men, and must report violations of orders.

(*a*) The mine foreman personally shall attend to his duties in the mine as provided in these orders, and shall see that the regulations provided herein for insuring the safety of all men employed in such mine are carried out; he shall immediately report to the superintendent of the mine or, in the absence of the superintendent, to the assistant superintendent or mine operator, any violations or infringements of these orders observed by him within the mine, and shall take immediate steps to remedy the

same. He shall permit no person to work in an unsafe place, unless for the purpose of making it safe or when work in such a place is unavoidable; and shall provide adequate supervision for the men in the performance of their work.

Mine foreman or assistants shall make two daily inspections of all underground working places.

(*b*) The mine foreman shall make or cause his assistants or shift bosses to make an inspection of every working place in the mine under his charge, at least twice during each shift or working day of eight hours. One of these inspections shall be made as early during the first half of the shift and the other as early during the second half of the shift as is consistent with the routine working of the mine; *provided,* that in the event of an undue number of accidents occurring in any mine, which, in the opinion of the Industrial Accident Commission, might be decreased by more frequent inspections, it shall be left to their discretion to require such additional inspections to be made by the mine foreman or his assistants or shift bosses.

Assistant mine foremen must be appointed when foreman can not carry out provision of orders.

(*c*) Whenever a mine foreman can not personally carry out the provisions of these orders, so far as they pertain to him, the superintendent shall employ or authorize the foreman to employ a sufficient number of competent persons to act as assistants, who shall be subject to the foreman's orders and shall be known as "assistant mine foreman," or "shift bosses," and they shall be under the direct supervision of the mine foreman and shall carry on the duties of the mine foreman as directed by him and as prescribed in other sections of these orders.

Superintendent is liable if he orders violation of orders.

(*d*) The mine foreman shall have charge of carrying out or directing the carrying out of his duties as prescribed in these orders; and any superintendent who

shall direct or cause a mine foreman to disregard the provisions of these orders shall be amenable in the same manner as the mine foreman.

Order 1711. **Report of Personal Injuries.**

Personal injuries must be reported to management by employees.

(*a*) Every personal injury occurring in or about any mine, including electric shocks and burns, and all accidents in connection with the operation of electrical equipment, shall be promptly reported to the mine superintendent's office by the person injured, or, if such person shall be unable to do so by reason of the injury, then it shall be so reported by the person in immediate charge of the work at the time of the injury, or by some person acting on behalf of the injured person; and shall be recorded in the mine office. These records shall at all times be open to examination by the chief mining engineer or mining engineer.

Record must be kept of all injuries.

Order 1712. **General Safety Precautions.**

Operator must take all reasonable precautions to protect men.

(*a*) The operator and superintendent of every mine shall use every reasonable precaution to insure the safety of the workmen in the mine in all cases, whether or not provided for in these orders.

Dangerous places must be fenced off.

(*b*) The mine foreman shall see that all dangerous places are properly fenced off and proper danger-signals are so hung on such fencings that they may be plainly seen.

Solitary employment forbidden.

(*c*) No man shall be employed at a working face at such a distance from another that his cries in case of need can not be heard, unless he is in communication with another employee at least once every four hours.

(*d*) All defects in or damage or injury to machinery or timbering, or to apparatus and equipment generally in and about a mine, all unsafe or dangerous conditions in any part of a mine, and all accidents occurring in the course of mine operations, other than those of a purely minor character, even though not resulting in personal injury, shall be promptly reported to the mine foreman or superintendent by the person observing the same. Employees must report unsafe conditions to management.

(*e*) Strangers or visitors shall not be allowed in any mill or smelter, or underground in any mine without a proper permit from the office, unless accompanied by the operator or an official, or an employee deputized by such operator or official to accompany them. Strangers must have permission to visit mining property.

(*f*) Only a bar blunt on one end shall be used for loading at chutes.

(*g*) All spikes or nails with points projecting shall be bent down or removed from lumber lying in working places or passage ways.

(*h*) Solitary employment in shaft retimbering is forbidden.

(*i*) Oilers and inspectors only shall be allowed to ride on aerial tramways.

(*j*) A boss or some responsible underground employee shall be on duty whenever men are working in the mine.

(*k*) At all mines where in the opinion of the Industrial Accident Commission a serious fire hazard exists, monthly fire drills shall be held and all employees instructed as to their duties in case of a mine fire. Monthly fire drills required.

The superintendent and foreman shall see to it that all underground employees are familiar with the mine

exits and keep a record of the monthly fire drills, in the mine office.

It is recommended that stenches be introduced into the compressed air line to warn underground men in case of a fire or "cave-ins." (Ethymercaptan recommended as a stench.) Also that underground men be notified that such a warning will be given in case of a disaster.

Order 1713. **Orders for Underground Men to be Posted on Bulletin Boards.**

Safety bulletin boards required.

Safety bulletin boards shall be provided at all mines. Orders for underground men, safety bulletins, pictures, slogans or circulars shall be posted on such bulletin boards.

Orders must be posted on bulletin boards.

Each workman employed in the mine, when first engaged, shall have his attention directed by the mine superintendent or one of his assistants to the provisions of the orders, which apply to underground employees. A notice shall also be posted in a conspicuous place to the effect that underground employees must read these orders and be governed by them.

INDUSTRIAL ACCIDENT COMMISSION ORDERS FOR UNDERGROUND MEN.

Violation of these orders constitutes a misdemeanor punishable by a fine of five hundred dollars or six months in jail, or both.

1. When working above or below other men, you must always let the others know about it.

2. It is forbidden to get off or on cage, skip or bucket while same is in motion.

3. You must place drill steel or other material far enough from the collar of any shaft, manway, raise or winze to prevent danger of material falling down opening.

4. Miners must not deepen holes, or any parts of holes, left standing or abandoned which have previously been charged with explosives.

5. You must bar down all loose pieces of rock or ore before you start mucking or drilling in a working place. Test the ground several times during the shift. Always stand to one side when pulling or picking down loose rock.

6. Examine closely any boulders or slab which you intend to drill, or to strike or break with hammer or pick. It may contain a drill hole filled with dynamite.

7. You must not remove any flooring, lagging, or timber of any kind whatsoever, which would make a dangerous opening, without instructions from the boss.

8. No person shall without authority handle electric wires or conductors, or electrical apparatus of any kind, or enter an electrical machine room or underground station.

9. Caps and powder must immediately be put in a safe place and not left lying about the mine.

10. Smoking when loading holes is strictly forbidden. Lighted candles and lamps must be left outside of powder magazine, and matches must not be lighted within the magazine.

11. In tamping powder, use only wooden loading sticks. Tamp by pressure.

12. Do not try to extract explosives from a "missed hole." When in doubt ask the boss.

13. Before blasting give warnings in every direction.

14. Report all "missed holes" as directed by the boss. In case of a "missed hole" do not return to your working place until forty-five minutes after blasting.

15. All accidents and injuries, however slight, must be reported to the foreman, or the superintendent's office upon or before going off shift.

16. If any employee drops any material or tools down the shaft, he shall immediately report the same, so the shaft may be inspected before continuing the regular work.

17. If anything occurs, where you are working, that you do not understand, such as the movement of a large block of ground, you must stop work and immediately tell the foreman or shift boss about it.

18. Only men familiar with the mine shaft shall be allowed to ride on the bail of the skip.

Remember that most accidents are caused by neglect of the little things, by disobeying rules and orders, or by carelessness.

Order 1714. Fencing Abandoned Shafts.

An act to provide for the covering or fencing of abandoned mining shafts, pits or excavations, the penalty, and also the penalty for removing or destroying the covering or fencing from same.

(Approved March 20, 1903.)

SECTION 1. All abandoned mining shafts, pits or other abandoned excavations dangerous to passersby or

live stock, shall be securely covered or fenced, and kept so, by the owners of the land or persons in charge of the same, on which such shafts, pits or other excavations are located. Any person or persons failing to comply with the provisions of this section shall be deemed guilty of a misdemeanor.

Abandoned mine shafts and other dangerous openings must be fenced or covered.

SEC. 2. All abandoned mining shafts, pits or other excavations situated on unoccupied public lands may be securely covered or fenced by order of the board of supervisors of the county wherein the same is situated, and it shall be the duty of the board of supervisors to keep the same securely fenced or covered whenever it appears to them, by proof submitted, that the same is dangerous or unsafe to man or beast. The cost of said covering or fencing to be a county charge.

SEC. 3. Any person or persons maliciously removing or destroying any covering or fencing placed around or over any shaft, pit or other excavation, as hereinbefore provided, shall be deemed guilty of a misdemeanor.

SEC. 4. This act shall take effect six months from the day of passage.

Order 1715. **Guard Rails.**

Moving machinery, stairs, trestles, etc., shall be provided with guards.

(*a*) All machinery used in or about any mine, that, when in motion, would be dangerous to persons coming in contact therewith, such as engines, wheels, screens, shafting, gears, and belting, shall be guarded by covering or railing so as to prevent persons from inadvertently walking against or falling upon the same. The sides of stairs, trestles, and dangerous plank walks, gangways, and platforms in and around the mines shall be provided with hand and guard railing to prevent persons from falling over the sides. This section shall

not forbid the temporary removal of a fence, guard rail, or covering for the purpose of repairs or other operations, if proper precautions be used, and if the fence, guard rail, or covering be replaced immediately thereafter. (See General Safety Orders on page 100.)

(*b*) See Order 1706 (*c*) of Mine Safety Orders.

Order 1716. **Waste Dump Tracks.**

(*a*) Waste dump tracks on the surface shall be kept in good condition and a bumper placed on end of each to prevent car rolling over the embankment. A proper runway for car men shall be provided.

Order 1717. **Camp Sanitation Act.**

An act regulating the sanitation and ventilation in and at camps where five or more persons are employed, and providing for a penalty for the violation thereof.

(Originally adopted 1913; Statutes of 1913, page 328. Amended 1915, page 497; 1919, page 244.)

The act as amended to date reads as follows:

Camp to be kept clean.

SECTION 1. In or at any camp where five or more persons are employed, bunk houses, tents or other suitable sleeping places must be provided for all the employees. Such bunk houses, tents, or other sleeping places must be in good structural condition, and so constructed as to provide shelter to the occupants against the elements and so as to exclude dampness in inclement weather. The bunk houses, tents and other sleeping places shall be kept in a cleanly state, and free from vermin and matter of an infectious and contagious nature, and the grounds around such bunk houses, tents or other sleeping places shall be kept

clean and free from accumulations of dirt, filth, garbage, and other deleterious matter.

Air space in bunk house.

SEC. 2. Every bunk house, tent or other sleeping place used for the purpose of a lodging or sleeping apartment in such camp, shall contain sufficient air space to insure an adequate supply of fresh air for each person occupying such bunk house, tent or other sleeping place. Suitable bunks or beds shall be provided for all employees. Such bunks or beds shall be made of steel, canvas or other sanitary material, and shall be so constructed as to afford reasonable comfort to the persons occupying the same.

Bunks.

Kitchen, etc., to be kept clean.

SEC. 3. Every mess house, dining room, mess tent, dining tent, kitchen, or other structure where food is cooked, prepared or served in such camp shall be kept in a clean and sanitary state and the openings of such structures shall be screened.

Bathing facilities.

SEC. 4. For every such camp there shall be provided convenient and suitable bathing facilities of a reasonable nature to suit conditions, which shall be kept in a clean and sanitary condition. For every such camp there shall be provided convenient and suitable privy or other toilet facilities, which shall be kept in a clean and sanitary state. A privy other than a watercloset shall consist of a pit at least two feet deep, with suitable shelter over the same, and the openings of the shelter and pit shall be enclosed by screening or other suitable fly netting. No privy pit shall be filled with excreta to nearer than one foot from the surface of the ground and the excreta in the pit shall be covered with earth, ashes, lime or other similar substance.

Toilet facilities.

Garbage disposal.

SEC. 5. All garbage, kitchen waste and other rubbish in such camp shall be deposited in suitable covered receptacles which shall be emptied daily or oftener if necessary, and the contents burned, buried or otherwise disposed of in such a way as not to be or become offensive or insanitary. All drainage from the kitchen sink shall be carried through a covered drain to a covered cesspool or septic tank or otherwise disposed of in such a way as not to become offensive or insanitary.

Duty of employees.

SEC. 6. It shall be the duty of any person, firm, corporation, agent or officer of a firm or corporation employing persons to work in or at camps to which the provisions of this act apply and the superintendent or overseer in charge of the work in or at such camps to carry out the provisions of this act. At every such camp such owner, superintendent or overseer shall appoint a responsible person to assist in keeping the camp clean.

Commission of immigration and housing to administer act.

SEC. 7. The commission of immigration and housing of California shall administer this act and secure the enforcement of the provisions thereof, and for such purposes shall have the right to enter and inspect all camps to which the provisions of this act apply. Any camp coming under the provisions of this act which does not conform to the provisions of this act is hereby declared a public nuisance and if not made to so conform within five days, or within such longer period of time as may be allowed by the commission of immigration and housing of California, after written notice given by the said commission, shall be abated by proper action

brought for that purpose in the superior court of the county in which such camp, or the greater portion thereof, is situated.

Violation of provisions.

SEC. 8. Any person, firm, corporation, agent or officer of a firm or corporation, or any superintendent or overseer in charge of the work in or at any camp coming under the provisions of this act, who shall violate or fail to comply with the provisions of this act, is guilty of a misdemeanor, and shall upon conviction thereof, be punished by a fine of not more than two hundred dollars, or by imprisonment for not more than sixty days, or by both such fine and imprisonment.

Penalty.

Order 1718. **Change Houses.**

The operator of every mine shall provide a dressing room or a change house at a place convenient to the mine exit, for the purpose of drying the clothing of the persons employed in and about the mine and such dressing room or change house shall be provided with adequate means of heating and lighting. Such dressing rooms or change houses shall be available to the men at all times when they are going on or coming off shift and shall be equipped with shower baths with hot and cold water, at least one shower being provided for each fifteen men on a shift, working in the mine. Such change houses shall be kept reasonably clean and in a sanitary condition.

Order 1719. An Excerpt from the Statutes and Amendments to the Codes of the State of California.

An act to require employers of labor to furnish, without charge, pure drinking water to their employees during working hours.

(Approved May 24, 1915. In effect August 8, 1915.)

Drinking water must be furnished.

SECTION 1. Every employer of labor in this state shall, without making a charge therefor, provide fresh and pure drinking water to his employees during working hours. Access to such drinking water shall be permitted at reasonable and convenient times and places.

Penalty.

Any violation of the provisions of this act shall be deemed a misdemeanor and punishable for each offense by a fine of not less than twenty-five dollars ($25.00), nor more than one hundred dollars ($100.00), or by imprisonment for not more than thirty (30) days, or by both such fine and imprisonment.

Order 1720. Sanitation, Dry Closets, Drinking Water.

Underground toilets are required.

(*a*) It shall be the duty of the operator of every mine, for the purpose of improving the sanitation thereof and preserving the health of those employed therein, to provide an ample number of dry or water-closets upon all main working levels for the use of all men employed in the mine. Ready means of access to each closet shall be provided by the operator. No such closet shall be constructed without adequate provision for the effectual cleansing and removing of the contents thereof, which shall be removed and disposed of often enough to prevent its becoming offensive. It shall be the duty of the mine foreman to cause each closet to be

supplied with some disinfectant or deodorizer to be sprinkled upon the contents thereof. It shall be the duty of all men employed within any mine where such closets are provided to use such closets exclusively when in the mine, and the neglect or failure of any man employed in a mine to use such closets when provided shall constitute a violation of these orders; *provided, however,* that this order shall not apply to any mine where the operator or superintendent prefers to permit the men to go to the surface, and requires the men to do so.

Good quality of drinking water shall be provided.

(*b*) It shall be the duty of the operator of every mine to provide a good quality of drinking water for the use of all men employed in the mine, a supply of which shall be provided on each main working level, and it shall be the further duty of the superintendent to cause such supply of drinking water to be adequately protected from contamination.

Order 1721. **Providing for Mine Exits.**

An act requiring compensation for causing death by wrongful act, neglect or default.

(Approved April 26, 1862.)

Two exits required for mines more than 300 feet deep.

SECTION 1. It shall not be lawful for any corporation, association, owner, or owners of any quartz mining claim within the State of California, where such corporation, association, owner or owners employ twelve men daily, to sink down into such mine or mines any perpendicular shaft or incline beyond a depth from the surface of three hundred feet without providing a second mode of egress from such mine, by shaft or

tunnel, to connect with the main shaft at a depth of not less than one hundred feet from the surface.

SEC. 2. It shall be the duty of each corporation, association, owner or owners of any quartz mine or mines in this state, where it becomes necessary to work such mines beyond the depth of three hundred feet, and where the number of men employed therein daily shall be twelve or more, to proceed to sink another shaft or construct a tunnel so as to connect with the main working shaft of such mine as a mode of escape from underground accident, or otherwise. And all corporations, associations, owner or owners of mines, as aforesaid, working at a greater depth than three hundred feet, not having any other mode of egress than from the main shaft, shall proceed as herein provided.

Order 1722. **Two Openings to Surface.**

Two escapeways to surface must be provided.

(*a*) It shall be the duty of every operator of every mine, except as hereinafter provided, to maintain at least two outlets to the surface from such mine, or an underground communicating passageway between every such mine and some other neighboring mine, so that there shall be at all times at least two distinct and available means of access to the surface to all persons employed in such mine. Such outlets shall not be less than one hundred feet apart and shall not be covered by one building or by connecting buildings.

(*b*) No mine shall be worked to a greater depth than five hundred feet below a level which connects to both outlets from the mine.

Some development work may be carried on with only one escapeway.

(*c*) *Provided, however,* that the above requirements shall not apply in the case of (1) shafts or mines in process of being connected, to comply with the terms

of this section; (2) shafts, winzes, adit levels, tunnels, and drifts to prospect for and develop mineral substances, but not for the extraction of mineral substances, except such as may be extracted in the course of such prospecting and developing work; (3) any mine in which one of the shafts or outlets shall have temporarily become unavailable for the persons employed in the mine, and in which every effort is being made by the operator of the mine to open such temporarily unavailable outlet, and provided the same is not, in the opinion of the Industrial Accident Commission dangerous to the life and health of those employed therein; (4) mines having workings less than three hundred feet deep, but no mines opened primarily by an adit level or tunnel, and (5) mines opened by an adit level, tunnel, or drift less than one thousand feet in length; *and provided, further,* that mines opened by an inclined shaft of less than twenty degrees angle from the horizontal shall be considered for the purpose of this section as equivalent to mines opened by adit levels, tunnels, or drifts.

Order 1723. **Openings Through Other Mines.**

Escapeways through other mines shall not be closed.

(*a*) When a communicating outlet shall have been established by agreement between contiguous mines or mines not contiguous, the operator of neither mine shall close the same, except temporarily in cases of extreme emergency, without the consent of both the other operator, or owner, and of the Industrial Accident Commission. When operators of such mines have by agreement established underground communication between said mines as an escapement outlet for the men employed in both, it shall be the duty of each operator to cause such

communicating outlet within his respective mine to be inspected at least once in every seven days, and it shall be the duty of each operator to see to it, within his respective mine, that the same is kept clear of every obstruction to travel, and that intervening doors, if any, shall be kept unlocked and ready at all times for immediate use.

Upkeep of escapeways through abandoned mines, etc.

(*b*) In the event of failure or refusal on the part of one operator to keep such opening in safe condition, the other operator shall have access thereto for the purpose of repairing and maintaining the same; *provided, however,* that when such an outlet shall have been established, each operator, unless it shall have been otherwise provided by agreement, shall pay a fair proportionate share of keeping such opening in such condition that men working in such mines may have access to the surface thereby; *provided, further,* that in the event of either operator desiring to abandon mining operations, the expense and duty of maintaining such communication shall devolve upon the party continuing operations and using the same; *provided, further,* that in case one of such mines shall cease or suspend operations and there is danger of the mine still in operation being flooded by reason of the existence of such communicating outlet, the operator of such mine still working shall have the right to close such outlet upon giving notice to the owner or operator of the adjoining mine and to the chief mining engineer.

Order 1724. **Provisions Affecting Mines Having Only One Outlet.**

(*a*) In every mine, where under the provisions of orders 1722 and 1723 of these orders, only one outlet is

required and where a single shaft affords the only means of ingress or egress to persons employed underground, such shaft if more than two hundred feet deep shall be divided into at least two compartments. One of said compartments shall be set aside for use as a ladderway and no hoisting conveyance shall be allowed therein. Whenever such ladderway compartment shall be covered by a nonfireproof building it shall be the duty of the operator of said mine to cause said ladderway to be securely bulkheaded at a point at least twenty-five feet below the collar of the shaft; and below this bulkhead a passageway shall be driven to the surface so as to have its outlet in no case less than thirty feet beyond the walls of the building covering the main shaft. The said passageway shall be equipped with a ladderway when necessary, as provided in subsequent rules, and shall be kept in good repair and shall afford an easy exit in the event of fire. Every mine opened by adit level or tunnel or by an inclined shaft or slope of less than twenty degrees angle from the horizontal, any of which less than one thousand feet in length, and having but one outlet, shall have a similar side outlet.

Ladderway compartments must be maintained in shafts of mines having but one outlet.

Order 1725. **Outlets Not to be Covered by Inflammable Houses.**

(*a*) After the approval of these orders no operator of any mine shall erect any combustible structure over the shaft, tunnel, or other mine opening, except headframes necessary for hoisting from such shaft or other mine opening, and the hatch or door necessary for closing such shaft or other mine opening; *provided, however,* that a housing of noninflammable and fireproof material may be erected over any shaft, tunnel,

Inflammable structures shall not be erected over mine outlets.

or other mine opening to protect the men working at such point.

(*b*) When the portal of any mine opening or the collar of any shaft is covered by a nonfireproof building the operator of the mine shall provide a fireproof door, which shall be and fit as nearly gas tight as possible. Said door shall be installed in such a way that the mouth of such mine opening can be closed from the outside of the building by a pull wire or cable, in the event of fire.

Order 1726. **Ventilation.**

Ample ventilation shall be provided.

(*a*) The operator of every mine, whether operated through shaft, slope, tunnel, adit level, or drift, shall provide and maintain for every such mine a good and sufficient amount of ventilation for such men and animals as may be employed therein, and shall cause an adequate quantity of pure air to circulate through and into all the shafts, winzes, levels, and all the working places of such mine.

19½ per cent oxygen required in mine air.

(*b*) Except in cases of emergency, men shall not be permitted to work in a place where the oxygen content of the air is less than 19½ per cent as determined by a Haldane black damp tester or by chemical analysis.

Dangerous gas must be reported to chief mining engineer.

(*c*) Inflammable gas shall be considered dangerous when it contains more than two per cent methane as shown by a Burrell gas detector or by a flame safety lamp approved by the United States Bureau of Mines.

It shall be the duty of the superintendent of any mine to immediately notify the office of the chief mining engineer whenever dangerous gas, such as methane, is discovered.

Where inflammable gas is encountered, sufficient air must be furnished so that the percentage of inflammable gas shall not exceed two per cent unless special permission to continue operations has been obtained from the Industrial Accident Commission.

Order 1727. **Safety Pillars.**

(*a*) No stoping shall be done within twenty feet of a shaft that is used for hoisting men or material; *provided, however,* that stoping may be done within twenty feet of such shaft if the Industrial Accident Commission has been first notified in writing and their approval secured.

Special permit required for stoping within 20 feet of shaft.

Order 1728. **Roof Inspection.**

(*a*) In all mines where stoping is done, it shall be the duty of the superintendent of the mine to detail a competent man to make a frequent inspection of the roof of those parts of the mine where men are employed, and said man so detailed shall be charged with the duty of dislodging any slabs of rocks in said roof that have become loose. While such dislodgment is being effected, the floor of the stope immediately beneath such loose rock shall be fenced off or otherwise adequately guarded; *provided, however,* that it shall be the duty of every miner to care for the roof of the place where he is working. In cases where the Industrial Accident Commission considers it necessary, this inspection shall be made at more frequent intervals, and in such manner, as may be directed.

Special inspections of certain stopes required.

(*b*) It shall also be the duty of the superintendent of every mine to cause frequent inspection to be made of the roof of all drifts, adit levels, tunnels and gangways by a competent person detailed for such purpose.

Order 1729. **Cleaning of Manways.**

(*a*) The timbers in all manways in daily use shall be cleaned of loose rock lodged upon them as often as necessary to keep them in safe condition for the passage of men. Manways shall be kept clear of obstructions.

Order 1730. **Timbering.**

Working places to be timbered when necessary.

(*a*) Every shaft, incline, slope, adit, tunnel, level, crosscut, or drift, and every working place in the mine shall be, when necessary, kept securely timbered or protected to prevent injury to any person from falling material. It shall be the duty of the operator to carry out and enforce the provisions of this order, but nothing contained herein shall be construed to relieve the miner from the duty of caring for his own working place, save as hereinafter provided.

Sufficient timber to be supplied by operator.

(*b*) It shall be the duty of the operator to see that all miners in the mine are supplied, at all times, with such timbers as are necessary to keep their working places in a safe condition. For the purposes of this and the succeeding orders the term "timbers" shall be held to include and mean all wood to be used by the miner.

Miners shall not work when sufficient timber is not supplied.

(*c*) If for any cause necessary timbers can not be supplied to any miner when required, it shall be the duty of the mine foreman to instruct the miner or miners to vacate all such working places until supplied with the timbers needed, but nothing contained herein shall be construed to relieve the operator of the duty of supplying such timbers.

Order 1731. **Winzes, Raises and Openings.**

Tops of winzes and raises must be protected.

(*a*) Winzes or other openings in the floor of a drift or stope shall be kept covered by a substantial hatch or bars, or shall be planked over, except when in use, or shall be barred off by a substantial railing not less than three and one-half feet nor more than four feet above the level of the floor, or shall be provided with a gangway on one side not less than twelve inches wide, which gangway shall have a substantial handrailing not less than three and one-half feet nor more than four feet above the floor, and the approaches to such gangway at either end shall be protected by a substantial railing not less than three and one-half feet nor more than four feet above the floor.

Drifts to be closed off when there is danger of falling material.

(*b*) Drifts used as manways intersecting overhead workings through which material is dropped shall be closed to the passage of persons by a substantial rail not less than three and one-half feet nor more than four feet in height above the floor of the drift, on each side of the working, whenever material is to be dropped through such working, and the drift shall be kept so closed during periods when the working is so in use.

Order 1732. **Shaft Protection.**

Protection required at shaft stations.

(*a*) At the top of all shafts and at all shaft stations, a gate, guard rail, or other protection subject to the approval of the Industrial Accident Commission shall be installed and kept in place except when the cage, skip bucket or other conveyance is being loaded or unloaded thereat. This order shall not forbid the temporary removal of the protection for the purpose of repairs or other operations if proper precaution to prevent danger to persons be taken.

Hatches provided where buckets used.

(*b*) In shafts where the inclination from the horizontal is forty-five degrees or more, if hoisting be done from greater depth than one hundred feet by means of a bucket, shaft doors shall be constructed that will prevent any material from falling into the shaft while the bucket is being dumped, and such doors shall be closed while the bucket is being dumped.

Passageways around shaft at level stations and skip pockets.

(*c*) All stations, levels or skip pockets driven or constructed after these orders are adopted, shall have such a passageway around the working shaft that crossing through the hoisting compartment may be avoided; entering or crossing the hoisting compartment of a shaft except to ascend or descend, or for the purpose of inspecting or effecting repairs, is prohibited; before repairs are commenced the person in charge of or directing the repairs shall inform the hoisting engineer of the nature thereof.

Order 1733. Places of Refuge.

(*a*) On every mine level in which mechanical haulage is employed, there shall be at intervals of not more than two hundred feet places of refuge affording a space of at least two and one-half feet in width between the widest portion of the car or train running on the tramway and the side of the haulage way.

(*b*) Every such place of refuge shall be kept constantly clear, and no refuse shall be placed therein, and no person shall in any way prevent access thereto.

Order 1734. Protection Against Water.

(*a*) No raise shall be allowed to approach within ten feet of any part of a winze, stope, or other opening in which there is a dangerous accumulation of water.

(*b*) When advancing a drift, adit level, or incline toward a mine working that is suspected to be filled with water, a bore hole shall be kept at least fifteen feet in advance of the breast of the drive when in the vicinity of such mine working, and also, if necessary, in directions laterally from the course of the drive. Such a working place shall not exceed six feet in width, and such additional precautionary measures shall be taken as may be deemed necessary to obviate the danger of a sudden breaking through of water.

Bore holes shall be kept ahead of workings approaching workings full of water.

(*c*) In every mine where, in the opinion of the Industrial Accident Commission there is danger of a sudden inburst of water, such additional raises, drifts, or other workings shall be constructed as are necessary, in the opinion of the Commission, to insure the escape of workmen from the lower workings.

Order 1735. **Stopes.**

(*a*) In stopes timbered with square setts the working floors shall be closely and securely lagged over. Openings in the floors shall be protected by railings, or gratings.

Order 1736. **Whims.**

(*a*) Whims in use at or in mines, shall be provided with a suitable stopper or some other reliable device to prevent running back of the bucket or other conveyance.

Order 1737. **Crossheads.**

(*a*) All vertical shafts more than three hundred feet deep, from which hoisting is done by means of a bucket, shall be provided with suitable guides, and in connection

with the bucket there shall be a crosshead traveling upon these guides, provided men are hoisted through, or work in such shafts regularly. The height of the crosshead shall be at least two-thirds of its width.

Order 1738. **Ladders and Ladderways.**

Ladderways shall be provided from lowest workings to surface.

It shall be the duty of the operator of every mine to provide in addition to any mechanical means of ingress and egress, at least one means of outlet for the miners by means of ladders from the lowest workings of the mine to the surface. Except in the case of swinging or extension ladders used for shaft sinking, all ladders and ladderways constructed after the approval of these orders shall be built as prescribed in the following:

(*a*) The distance between the centers of the rungs of a ladder shall not exceed fourteen inches and shall not vary more than one inch in any one ladderway. The length of the ladder rungs (width of ladder) shall not be less than twelve inches.

(*b*) The rungs of a ladder shall in no case be less than three inches from the wall or other obstruction in the shaft or opening in which the ladder shall be used.

Platforms required in ladderways.

(*c*) Every main ladderway with an inclination of more than seventy degrees from the horizontal, the distance between the top and bottom of which is more than fifty feet, shall have substantial platforms at intervals of not more than thirty feet, measured vertically. Where the inclination of any ladder or section of a ladder, in main ladderways, exceeds eighty degrees from the horizontal, the sections of the ladders shall be staggered at each platform so that no section shall be directly in line with the section above or below it.

(*d*) The opening in any such platform shall be approximately twenty-one by twenty-four inches.

(*e*) Ladders shall project at least three feet above every platform in the ladderway and at least three feet above the collar of the shaft, unless convenient and secure hand holds are fixed at such places. Hand holds.

(*f*) In ladderways, other than main ladderways, not exceeding one hundred feet in depth or height, ladders may be fixed vertically. No vertical ladders shall be used with a greater height or depth than one hundred feet. Vertical ladders.

(*g*) Under no circumstances shall any ladder inclining backward from the vertical be installed.

(*h*) Ladderways shall be provided in all shafts steeper than sixty degrees from the horizontal in the course of sinking, to within such a distance from the bottom thereof as will secure them from damage by blasting. From the end of such ladderways, chain, wire rope or wooden extension ladders, or chains to reach to the bottom of the shaft shall be provided. Extension ladders or chains required when sinking shafts.

Order 1739. **Elimination of Rock Dust.**

(*a*) No operator or person in charge of any underground mine shall cause to be drilled or bored by machinery, a hole or holes in any working place in ground that causes dust from drilling, unless said machinery is equipped with a water jet or spray, or other means equally efficient are used to prevent the Dust from drilling must be allayed, or men required to wear respirators.

inhalation of dust; *provided,* that when water jets or sprays are used, water free from pollution with organic or other noxious matter, shall be furnished.

Dust from chutes must be allayed or men required to wear respirators.

(*b*) Every mine operator shall equip all chutes, from which dusty ore or rock is taken, with a sprinkler or other device with which to effectively dampen said ore or rock, to prevent the escape of dust into the air during removal; *provided,* that this equipment need not be installed if the loaders at said chutes are compelled to wear respirators.

(*c*) Whenever a sprinkling device is installed at any chute for the purpose of preventing the escape of dust, it shall be so placed that it can be operated by the workmen loading cars from such chute.

Dust in ore houses must be allayed or men required to wear respirators.

(*d*) Every ore house where dusty ore or rock is sorted shall be supplied at all times with suitable clean water, which shall be used for the purpose of sprinkling said ore or rock to allay the dust, or else men working in said ore houses shall be compelled to wear respirators.

Order 1740. **Lighting and Candles.**

(*a*) No candle shall be left burning in a mine or any part of a mine when the person using the candle shall depart from his work for the day.

(*b*) Stationary lights shall be provided during the working hours at all shaft stations during the time the same are in actual use, and also at all stations on the levels where hoisting or hauling is effected by means of machinery; also at night at all places on the surface where work is being conducted. Stationary lights are required at shaft stations and in pump rooms.

(*c*) All places where hoisting, pumping or other machinery is erected, and in the proximity of which persons employed in the mine are working or moving about, shall be so lighted that the moving parts of such machinery can be readily distinguished.

(*d*) If carbide is stored underground it shall be kept in metal containers, so placed that there will be no danger of the stored carbide coming in contact with water. Underground storage of carbide.

Order 1741. **Inflammable Material.**

(*a*) It shall be the duty of the operator of every mine in which oils and other dangerous inflammable materials are used, to store such materials, or cause them to be stored, in a covered building kept solely for such storage, which building shall be at least one hundred feet from any shaft, tunnel, or other mine opening, or building over a mine opening, and at least three hundred feet from any powder magazine; *provided,* that gasoline, naphtha, distillate, and fuel oils may be stored in a tank or tanks buried in the ground, which tank or tanks shall be provided with proper vents, and shall be placed at least fifty feet from any shaft, tunnel, or other mine opening, or building over a mine opening, and at Requirements for storage of oils and inflammable materials.

least three hundred feet from any powder magazine; *and provided further,* that lubricating oils may be stored in a well-constructed, covered building, which shall be at least fifty feet from any shaft, tunnel, or other mine opening, or building over a mine opening, and at least three hundred feet from any powder magazine. No tank shall be installed from which oil is to be conducted by gravity to the point of combustion, unless such tank shall be so located that escaping oil can not run over the surface from such tank to any building, within one hundred feet of any mine opening.

Only three days' supply of oil is to be taken from storage place.

(*b*) The man in charge of such building or tank or tanks, who shall be the superintendent or a person expressly designated by him, shall permit only sufficient oil or other inflammable material to be taken from such building or tank or tanks to meet the requirements of paragraph (*c*) of this order. If any oil or gasoline storage be so situated that leakage would permit the oil or gasoline to flow within the above-specified distances, means to prevent such flow must be provided.

Underground storage of oil.

(*c*) Oil, either lubricating or illuminating, shall not be taken into the underground workings of any mine or kept therein in quantities greater than necessary to afford three days' supply, except when the transportation and storage are arranged for in a manner satisfactory to the Industrial Accident Commission.

(*d*) The use of gasoline underground is forbidden except in small amounts such as is required for blow torches.

(*e*) The use of fuel burning engines or locomotives underground is forbidden.

(*f*) Waste timber or old timber shall not be piled and permitted to decay in the mine but shall be removed from the mine promptly. Empty boxes, wooden chips, paper and combustible rubbish of all kinds shall not be allowed to accumulate underground. Waste materials must be taken to surface.

(*g*) Timber framing or storage sheds or any inflammable structure or piles of inflammable material shall not be placed or permitted to remain within one hundred feet of any mine opening, shaft house or hoisting-engine house; *provided, however,* that wooden headframes for hoisting and lowering may be erected and operated, and wooden structures within one hundred feet of headhouses over or near shafts or openings, which have been return airways continuously for the past two years, need not be removed during the time the said shafts or openings continue to be return airways at all seasons. But if said shafts or openings should, for any reason, become intake airways at any time, then the foregoing part of this subdivision shall apply, provided that if fire and gas proof doors, approved by the Industrial Accident Commission be installed, exceptions may be made to the above provisions. Inflammable material shall not be stored near mine openings.

(*h*) All inflammable material that may be stored in any existing house or structure erected over any shaft, tunnel, or other mine opening shall be immediately removed, and such inflammable material shall not be stored within fifty feet of the exterior walls of such house or structure now existing, or that may hereafter be built. Inflammable materials.

(*i*) All oily waste and waste of any kind used in and about underground machinery shall be deposited in metal receptacles. Oily waste removed from underground.

Order 1742. Regulations Provided for Control of Explosives.

An act relating to explosives and prescribing regulations for the transportation, storage and selling of explosives, and providing penalties for the violation of this act.

(Approved March 20, 1911.)

Definitions and application.

SECTION 1. The term "explosive" or "explosives" whenever used in this act, shall include gunpowder, blasting powder, dynamite, guncotton, nitroglycerine or any compound thereof, fulminate, and every explosive substance having an explosive power equal to or greater than black blasting powder, and any substance intended to be used by exploding or igniting the same to produce a force to propel missiles, or rend apart substances, but does not include said substances, or any of them, in the form of fixed ammunition for small arms. The term "person" whenever used herein shall be held to include corporations as well as natural persons; words used in the singular number to include the plural and the plural the singular. The words "explosive manufacturing plant" shall be understood to include all the land used in connection with the manufacture and storage of explosives thereat.

Containers are required for explosives.

SEC. 2. Except only at an explosive manufacturing plant, no person shall have, keep or store, at any place within the state, any explosives unless such explosives are completely enclosed and encased in tight metal, wooden or fibre containers, and, except while being transported, or within the custody of a common carrier pending delivery to consignee, shall be kept and stored in a magazine constructed and operated as hereinafter

described, and no person having in his possession or control, any explosives, shall under any circumstances permit or allow any grains or particles thereof to be or remain on the outside or about the containers, in which such explosives are contained.

SEC. 3. Magazines in which explosives may lawfully be stored or kept shall be two classes, as follows:

Construction and regulation of large magazines.

(*a*) Magazines of the first class shall consist of those containing explosives exceeding one hundred pounds, and shall be constructed wholly of brick, wood covered with iron, or other fireproof material, and must be fireproof, and, except magazines where gunpowder or black blasting powder only is stored, must be bullet proof, and shall have no openings except for ventilation and entrance. The doors of such magazines must be fireproof and bullet proof, and at all times kept closed and locked, except when necessarily opened for the purpose of storing or removing explosives therein or therefrom, by persons lawfully entitled to enter the same. Every such magazine shall have sufficient openings for ventilation thereof, which must be screened in such manner as to prevent the entrance of sparks or fire through the same. Upon each side of such magazine there shall at all times be kept conspicuously posted a sign, with the words, "Magazine," "Explosives," "Dangerous," legibly printed thereon in letters not less than six inches high. No matches, fire or lighting device of any kind except electric light, shall at any time be permitted in any such magazine. No package of explosives shall at any time be opened in any magazine, nor shall any open package of explosives be kept therein. No blasting caps, or other detonating or fulminating caps, or detonators, or electric fuzees, shall be kept or stored

in any magazine in which explosives are kept or stored, but such caps, detonators or fuzees may be kept or stored in a magazine constructed as above provided which must be located at least one hundred feet from any magazine in which explosives are kept or stored. Magazines in which explosives are kept or stored must be detached, and must be located at least one hundred feet from any other structure.

Construction and regulation of small magazines.

(*b*) Magazines of the second class shall consist of a stout box, and not more than one hundred pounds of explosives shall at any time be kept or stored therein, and, except when necessarily opened for use by authorized persons, shall at all times be kept securely locked. Upon each such magazine there shall at all times be kept conspicuously posted a sign with the words, "Magazine," "Explosives," "Dangerous," legibly printed thereon.

Tunnels with iron doors may be used as magazines.

Nothing in this section contained shall be held to prohibit the keeping or storing of explosives in any tunnel, where no person or persons are employed; *provided, always,* that any tunnel so used for the storage of explosives shall have fireproof doors, which must at all times be kept closed and locked, except when necessarily opened for the purpose of storing or removing explosives therein or therefrom, by persons lawfully entitled to enter the same. The door of such tunnel magazine shall at all times have legibly printed thereon the words, "Magazine," "Explosives," "Dangerous."

Penalty.

SEC. 4. Any person violating or failing to comply with any of the provisions of sections two and three of this act, shall be guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not less than twenty-five dollars, and not more than one

thousand dollars, or by imprisonment not exceeding six months, or by both such fine and imprisonment.

SEC. 5. It shall be unlawful to transport, carry or convey, any explosives between any places within this state, on any vessel, car or other vehicle of any description, operated by common carrier, which vessel, car or vehicle is carrying passengers for hire; *provided,* that it shall be lawful to transport on any such vessel, car or vehicle, small arms ammunition in any quantity, and such fuses, torpedoes, rockets or other signal devices, as may be essential to promote safety in operation, and properly packed and marked samples for laboratory examination, not exceeding a net weight of one-half pound each, and not exceeding twenty samples at one time, in a single vessel, car or vehicle, but such samples shall not be carried in that part of the vessel, car or vehicle, which is intended for the transportation of passengers for hire; *provided, further,* that nothing in this section shall be construed to prevent the transportation of military or naval forces with their accompanying munitions of war on passenger equipment vessels, cars or vehicles; *provided, further,* that the transportation of explosives on any freight train in this state that carries passengers for hire in a car or caboose attached to the rear of such train, shall not be held or construed to violate the provisions of this act.

SEC. 6. The railroad commission of this state is hereby empowered to make, publish and promulgate such regulations as are not in conflict with this act and as in the judgment of said commission may tend to the safe packing, loading, storage and transportation of the explosives defined by section one of this act.

SEC. 7. It shall be unlawful to transport, carry or convey liquid nitroglycerine, fulminate in bulk, in dry condition, or other like explosive between any places within this state, on any vessel, car or vehicle of any description, operated by common carrier in the transportation of passengers, or articles of commerce by land or water.

SEC. 8. Every package containing explosives or other dangerous articles when presented to a common carrier for shipment shall have plainly marked on the outside thereof, the contents thereon, and it shall be unlawful for any person to deliver for transportation to any common carrier engaged in commerce by land or water, or to cause to be delivered or to carry any

explosive or other dangerous article, under any false or deceptive marking, description, invoice, shipping order or other declaration, or without informing the agent of such carrier of the true character thereof, at, or before the time of such delivery or carriage is made.

SEC. 9. Any person who wilfully violates or causes to be violated any of the foregoing provisions of sections 5, 6, 7, and 8, of this act, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished for each offense by fine not exceeding two thousand dollars, or by imprisonment not exceeding eighteen months, or by both such fine and imprisonment in the discretion of the court.

SEC. 10. Every person selling, giving away, or delivering explosives within this state, shall keep at all times an accurate journal or book of record, in which must be entered from time to time, as it is made, each and every sale, delivery, gift, or other disposition made by such person in the course of business, or otherwise, of any quantity of such explosive substance. Such journal or record book must show in a legible handwriting, to be entered therein at the time, a complete history of each transaction, stating name and quantity of explosives sold, delivered, given away, or otherwise disposed of; name, place of residence, and business of the purchaser or transferee, name of individual to whom delivered, with his or her address. Such journal or record book must be kept by the person so selling, delivering or otherwise disposing of such explosives, in his or their principal office or place of business, at all times subject to the inspection and examination of the police authorities of the state, county, or municipality where same is situated, on proper demand therefor. In addition to keeping the record above provided, it shall be unlawful for any person to sell, give away, or deliver any explosives within this state, without taking from the person to whom such explosives are sold, given away or delivered within this state, a statement in writing, showing the name and the address of the person to whom such explosives are sold, given away or delivered, and the place where and the purpose for which such explosives are intended for use, which statement shall be signed by the person to whom such explosives are sold, given away or delivered, or his agent, and be witnessed by two witnesses, known to the person selling, giving away or delivering such explosives, to be residents of the county where such explosives, as shown by such statement, are intended for

use, who shall certify that the person to whom such explosives are to be sold, given away or delivered is personally known to each of said witnesses, and that to the best of his knowledge and belief, the explosives are required by such person for the uses and purposes set forth in the statement, which said statement shall at all times be kept on file in the principal office or place of business of the person so selling, giving away or delivering such explosives, subject to the inspection of the police authorities of the state, county or municipality where the same is situated, on proper demand made therefor; *provided,* that nothing in this section shall be held to apply to the delivery of explosives to any person or carrier for the purpose of being transported from a place within this state to any other place within this state; *and provided, further,* that nothing in this section contained shall apply to interstate commerce.

Every person selling, giving away or delivering any explosives without complying with all the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than one hundred dollars, and not more than two thousand dollars, or by imprisonment of not less than six months, or by both such fine and imprisonment in the discretion of the court.

In addition to such imprisonment and as cumulative penalty such person so offending shall forfeit for each offense, the sum of two hundred and fifty dollars, to be recovered in any court of competent jurisdiction, and the party instituting the action for such forfeiture shall not be entitled to dismiss same, without the consent of the court before which the suit has been instituted; nor shall any judgment recovered be set aside, satisfied or discharged save by order of such court, after full payment into court, and all moneys so collected must be paid to the party bringing suit.

SEC. 11. (Repealed by Chapter 538, Laws of 1917.)

Only authorized persons are permitted in magazines.

SEC. 12. No person, except a peace officer or a person authorized so to do by the owner thereof, or his agent, shall enter any explosive manufacturing plant, magazine or car containing explosives in this state, and any person violating any of the provisions of this section shall be deemed guilty of a misdemeanor, and upon

conviction thereof, shall be fined in an amount not exceeding one thousand dollars, or by imprisonment not exceeding three months, or by both such fine and imprisonment.

Firearms shall not be discharged near magazines.

SEC. 13. No person shall discharge any firearms within five hundred feet of any magazine or of any explosive manufacturing plant, and any person wilfully violating any of the provisions of this section shall be deemed guilty of a misdemeanor and fined not exceeding one thousand dollars, or by imprisonment not exceeding one year, or by both such fine and imprisonment.

SEC. 14. No person shall wilfully carry any explosive on his person within this state in any car, vessel or vehicle that carries passengers for hire, or place or carry any explosive while on board any such car, vessel or vehicle, in any hand baggage, roll or container, or place any explosive in any baggage thereafter checked with any common carrier, and any person violating any of the provisions of this section shall be deemed guilty of a felony and upon conviction thereof shall be punished by imprisonment in the penitentiary not exceeding two years.

SEC. 15. Nothing in this act contained shall prevent the operation of, or modify, alter, set aside or supersede the provisions of any municipal ordinance respecting the delivery, storing and handling of explosives.

SEC. 16. Nothing in this act contained shall regulate or apply to any shipment of explosives from a point within this state, consigned to a point without this state, over a line or lines of one or more common carriers.

Order 1743. Storage and Use of Explosives.

(*a*) No explosive shall be kept at any place within a mine where its accidental discharge would cut off the escape of miners working therein.

(*b*) All explosives within the mine shall be kept in stout, tight boxes with hinged lids and locks, from which the explosives shall be removed only as required for immediate use; *provided,* that explosives stored in underground magazines constructed as provided for in the subsequent parts of this order need not be kept in such boxes. It shall not be permitted to keep such boxes containing explosives near any electric conductors or in any manway or haulageway, or to permit any grains or particles of such explosives to be or remain on the outside or about the containers in which such explosives are held. Black blasting powder and high explosives shall not be kept in the same box. This paragraph shall not be construed as applying to electric lights within the magazine at a distance not less than five feet from the explosives.

Explosives shall be kept in locked boxes or magazines when underground.

Explosives must not be kept near electrical conductors.

(*c*) Not more than one hundred pounds of explosives shall be kept in any one leval at any one time, except that one day's supply of explosives may be stored in an underground magazine, from which supplies required for immediate use shall be distributed by an authorized and competent person or persons. Such underground magazines may consist of a separate drive or chamber, the walls of which shall be of fireproof material or of wood covered with sheet iron. The entrance to such underground magazine shall be kept securely locked, except when it has to be entered by the person or persons in charge thereof. In cases where in the opinion of the Industrial Accident Commission greater safety will be provided by the storage of more than one day's supply of explosives underground, permission may be secured by the operator for the construction of a suitable underground magazine.

Magazines must be kept locked.

Magazines must be kept clean and dry.

(*d*) Magazines shall at all times be kept clean and dry and free from grit. Before any alterations are made to any part thereof, all explosives shall be carefully removed and the magazine thoroughly washed out. All tools and instruments used in making repairs shall be of wood, copper, brass or other soft metal or material. In no case shall nails or screws be driven into a magazine or into material that has once formed a part of a magazine, and all wooden parts discarded shall be burned in a safe place immediately.

Caps must not be kept with powder underground.

(*e*) No detonator shall be stored within fifty feet of other explosives underground.

No detonator shall be taken into any magazine containing other explosives.

No detonator shall be transported with other explosives except when being carried to the face for immediate use.

(*f*) All primers and capped fuses shall be exploded within thirty-six hours after making. This does not include delay action electric exploders.

Detonators shall not be removed from original containers except as they are used for capping fuses.

Powder boxes must not be opened inside the magazine.

(*g*) When supplies of explosives or fuse are removed from a magazine, those that have been longest in the magazine shall be taken first. Packages of explosives shall be removed to a safe distance from the magazine before being opened, and no such packages shall be opened with any metallic instrument, except a copper or bronze instrument.

Thawing dynamite.

(*h*) Every mine thawing dynamite or other explosives containing nitroglycerine shall be provided with a separate place for that purpose on the surface, or with a special underground chamber, which shall be a sepa-

rate drift or crosscut, and it shall be prohibited to thaw explosives in any other place or in any other manner than as provided for in this order.

(*i*) Dynamite or other explosives containing nitroglycerine shall not be thawed by any means other than a steam bath or a hot-water device, or by manure, or by electric current. If steam or water be the agent employed, the stove, boiler or other primary source of heat shall not be nearer to the thawing room than ten feet. If electric current be the thawing agent, the current shall not be brought within five feet of the explosive to be thawed, and in no case shall these explosives while being thawed, be exposed to a temperature higher than eighty degrees F.

Thawing dynamite or other explosive containing nitroglycerine by placing it near a fire or near a steam boiler is prohibited.

Dynamite or other explosive containing nitroglycerine shall not be thawed by direct contact with steam.

(*j*) Explosives shall not be carried underground on an electric locomotive and no one except the train crew or powdermen shall be allowed to ride on a train carrying explosives.

(*k*) Explosives shall not be placed or left within five feet of live electric wires. Special precautions.

(*l*) No person shall remove any explosive from a mine or magazine without the written or verbal orders of the superintendent, foreman or shift foreman of the mine. Removal of explosives.

(*m*) Fire extinguishers or hydrants and hose shall be provided and kept ready near all powder magazines and underground powder distributing stations for use in case of fire outside the magazine. Fire protection.

Smoking.

(*n*) Smoking in a powder magazine, at a powder distributing station, or while handling powder, is strictly forbidden.

Combustible substances.

(*o*) Oils or other combustible substances shall not be kept or stored in, or nearer than one hundred feet to, an underground powder magazine or distributing station.

Order 1744. **Fuse.**

Rate of burning.

(*a*) At any mine, no fuse shall be used that burns faster than one foot in thirty seconds or slower than one foot in fifty-five seconds.

Notice posted.

(*b*) Notice shall be posted at the entrance of every mine stating the rate of burning of the fuse used in such mine. The superintendent shall be responsible for the carrying out of this order.

Water-proofing.

(*c*) The use of oil or grease to waterproof joints between cap and fuse is forbidden. These injure the fuse. Use a compound which will not injure the fuse.

Capping.

(*d*) In capping fuse, at least one inch shall be cut from the end of each coil of fuse to be used in blasting. This will prevent damp fuse ends from getting into the cap.

(*e*) Only a crimper shall be used for attaching fuse to blasting cap. The practice of crimping with knife or teeth is forbidden. The mine operator shall furnish and keep in accessible places, ready for use, crimpers in good repair.

Injured fuse.

(*f*) It is forbidden to use fuse that has been hammered or injured by falling rocks or from any other source. Such injury increases the rate of burning.

(*g*) In cold weather warm fuse slightly before uncoiling, to avoid broken or cracked fuse.

(*h*) Fuse shall not be stored underground for a longer period than seventy-two hours unless the storage place is perfectly dry and the relative humidity of the air is less than eighty per cent. The hanging of fuse on nails or other projections, which causes a sharp bend to be formed in the fuse, shall be prohibited. Special precautions and storage requirements.

Order 1745. **Blasting.**

(*a*) Bosses or shot firers shall be in immediate charge of, and responsible for, blasting within the mine. It is forbidden to use anything but wooden tamping rods, with no metal parts, in tamping explosives or tamping material in the bore holes, and it shall be the duty of the bosses or shot firers to see that no metal tools are used for tamping. Detonators, when used in firing blasts, shall be of not less strength than No. 6, containing one gram of fulminating composition. It shall be the duty of the mine foreman to fix the time of all blasting and firing. Bosses or shot firers and miners about to fire shots shall cause warnings to be given in every direction, and all entrances to the place or places where charges are to be fired shall be guarded, so far as possible. Bosses to have charge of blasting.

(*b*) The number of explosions in every blast, except in cases of simultaneous firing, shall be counted by the man firing the same, and if the total number of explosions is less than the number of charges fired, a report of the discrepancy shall be made as the superintendent shall direct. When a blast has been fired and it is not certain that all the charges have exploded, no person shall enter the place where such charges were placed within forty-five minutes after the explosion. Missed holes must be reported.

Explosives shall not be extracted from missed holes.

(*c*) No miner shall be permitted to extract or attempt to extract explosives from a bore hole that has once been charged, but shall, when possible, put in a new primer and blast again. When not possible to do this, a new hole may be drilled, which shall not be nearer to the original hole than two feet, and shall be pointed at such an angle as to eliminate all danger of its meeting or coming closer to the other hole than two feet, and such new hole shall be charged with a fresh charge of explosives and then detonated; *provided,* that when the above can not be complied with, a hole nearer than two feet may be drilled under the direct supervision of the shift boss.

Precautions for electric firing.

(*d*) When electricity is used to fire shots, it shall not be permitted for any person knowingly to enter the vicinity of the place where such shots have been fired, until the cable from the source of electrical energy to the face of the blast shall have been disconnected. It shall be the duty of the boss or shot firer to see that all such cables are disconnected immediately after such firing, and to examine or direct the examination of such place where shots have been fired before any men are permitted to work therein.

(*e*) It shall be the duty of the boss or shot firer to see that special precautions are taken against the shot-firing cables or wires coming into contact with the lighting, power, or other circuits, or with any metal pipe lines. All portable devices for generating or supplying electricity for shot firing shall, when in the mine, be in charge of a boss or shot firer. No person other than a boss or shot firer shall connect the firing machine or battery to the shot-firing leads, and such connection

shall not be made until all other steps preparatory to the firing of a shot shall have been completed, and the men removed to a safe distance. The primary or secondary batteries used for shot firing shall be provided with a suitable case in which all contacts shall be made or broken, except that the binding posts for making connections to the firing leads may be outside. These binding posts shall be completely covered with insulating material of a permanent character, such as hard rubber, fiber, etc., except at the points where the firing leads make connections with the binding posts. Such batteries shall be provided with a detachable plug or key without which the detonating circuit can not be closed, or provided with one or more safety contact buttons that are well countersunk or protected by a non-conducting housing. The plug or key shall be detached when not actually in use for firing a shot, and shall not, under any circumstances, pass from the custody of the boss or shot firer.

(*f*) Electricity from light or power circuits shall not be used for firing shots in a mine, except where the electrical connections to such light or power circuits are made within an inclosed switch box, which shall be kept securely locked and shall be accessible only to the authorized boss or shot firer.

(*g*) No man shall "spit" more than *fifteen fuses* at one time, and should it be necessary to blast a greater number of holes than fifteen, he must have assistance.

(*h*) Instantaneous electric caps shall not be used in the same round with delay action caps.

(*i*) Machines and all metal tools shall be removed from the immediate location of holes before explosives are delivered.

(*j*) Except when single sticks are used, at least one cartridge or stick of powder (more is not objectionable) shall be tamped in the bottom of the hole before the primer cartridge is inserted.

(*k*) Electric exploders only shall be used in shaft sinkings, except when such use is not feasible.

Order 1746. **Hoisting.**

Speed of hoisting men.

(*a*) The superintendent of the mine shall establish for each shaft, rates of speed for the cages, skips, buckets, or other conveyances that shall not be exceeded in the hoisting or lowering of men, and he shall post a notice of such limitation in a conspicuous place near each hoisting engine.

Superintendent shall determine number of men to ride on cage, skip or bucket.

(*b*) The superintendent of the mine shall determine the maximum number of men that in his judgment may safely ride on each cage, skip, bucket, or other conveyance used in the mine under his supervision, and shall post in a conspicuous place near each shaft, a notice stating the maximum number of persons so permitted to ride and forbidding the carrying of any greater number. At the beginning of each shift, the mine foreman or shift boss, or some other responsible person appointed by the superintendent, shall be stationed on the loading platform at the top of the shaft and shall prevent any greater number of men than that permitted by order of the superintendent to enter upon or into any cage, skip, bucket, or other conveyance, and he shall remain at this station until the last man about to descend the shaft shall have entered the cage, skip, bucket, or other conveyance. At the end of the shift the man in charge of work on each level of the mine from which men are to be hoisted shall post himself in

the station of the shaft at that level and shall prevent any greater number of men than the maximum permitted by the superintendent of the mine to enter upon or into any cage, skip, bucket, or other conveyance and shall remain in this station until the last man to ascend shall have entered upon or into the cage, skip, bucket, or other conveyance; *provided,* that when a conductor is employed as required by paragraph (*c*) of this order, the man in charge of each level need not remain until all men are hoisted.

Cager or skip tender shall be employed.

(*c*) In every mine operated on two or more levels in which twenty-five or more men are employed underground on any one shift, and in which men to the number of twenty-five are hoisted or lowered by cage or other conveyance other than a bucket, such cage or other conveyance shall be operated under the charge of a person appointed as conductor, and no person other than this conductor shall give any signal for the movement of the cage, skip, or conveyance. The aforesaid conductor shall have all necessary authority to prevent crowding or scuffling of men in the vicinity of the shaft.

Speed of hoisting with bucket limited.

(*d*) In hoisting or lowering men with a bucket, the speed, except in the case of apprehended danger, shall not exceed two hundred feet per minute when the bucket is within one hundred feet of the surface or bottom, or five hundred feet per minute in any other part of the shaft.

Skip tracks.

(*e*) In inclined shafts where men are hoisted, the use of wooden rails or the use of strap iron on wooden stringers to form skip tracks is forbidden, unless said strap iron is bolted in place at the joints, or equivalent safety precautions be taken. When strap iron is used and the live load exceeds 2,500 pounds or the hoisting

speed exceeds 250 feet per minute said strap iron shall be at least one-half inch by two inches.

Special precautions for inclined shafts.

(*f*) In inclined shafts where the dip exceeds thirty-five degrees from the horizontal and men are hoisted in skips, the space between the hoisting compartments at each level station shall be so closed by lining boards that it shall be impossible for men to walk on the dividers when getting into or out of the skip, or an iron bar (of approximately one-half inch diameter and of a length equal to at least twice the distance between the wall plates) shall be so placed as to give men an easy and secure overhead hand hold while walking on the divider.

(*g*) No open hook shall be used with a bucket, cage or skip in hoisting, but some approved form of safety hook or shackle hook shall be used.

(*h*) The superintendent of the mine shall be responsible for the enforcement of the provisions of this order.

Order 1747. Hoisting Engineers.

Competent hoisting engineers shall be appointed, and must undergo a physical examination.

(*a*) It shall be the duty of every superintendent of every mine having a hoisting engine, to appoint and designate one or more men, who shall be able to speak and read the English language readily, to be known as hoisting engineers. The superintendent of each mine shall cause each hoisting engineer in his employ to undergo a thorough physical examination at least once in each year. Such examinations may be made by any competent physician authorized to practice medicine in California. In each instance a copy of the physician's findings shall be filed with the superintendent of the mine. No hoisting engineer who, in the opinion of the

mine superintendent, is physically unfit to perform his duties, shall be permitted to hoist or lower men. At all shafts where men are hoisted or lowered, such hoisting engineers shall be not less than twenty-one years of age, and at shafts where men are not so hoisted or lowered, they shall be not less than eighteen years of age. It shall be the duty of every superintendent to appoint as hoisting engineers men who are familiar with the details and working of a hoisting engine, and except in cases of emergency, to permit no others than such duly appointed hoisting engineers to run such engine or hoisting machinery; except that, by and with the consent of the superintendent, learners may be taught the operation of the hoisting engine at such times and under such restrictions as the superintendent may determine to be free of risk to life and limb.

Order 1748. **Duties of Hoisting Engineer.**

The following orders shall be observed by every hoisting engineer employed within this state:

(1) It shall be the duty of every hoisting engineer to keep a careful watch over his engine and over all machinery under his charge.

(2) He shall at all times be in immediate charge of his engine, and shall not at any time delegate any of his duties to any other person, except to learners duly designated as provided in these orders; *provided, however,* that nothing herein contained shall be construed to prevent any hoisting engineer from delegating to or sharing his duties with any other duly appointed hoisting engineer, or turning over the engine and machinery

in his charge to any other such engineer at the end of his shift.

(3) He shall familiarize himself with and use all signal codes for hoisting and lowering as directed to be used in these orders.

(4) He shall not run his engine unless the same is properly provided with brakes, indicators, or distance marks on hoisting ropes or cables, as provided in these orders.

(5) It shall be the duty of the hoisting engineer to exclude every person from his engine room, excepting any person or persons whose duties require their presence therein, and visitors authorized by the superintendent of the mine.

(6) He shall hold no conversation with any one while his engine is in motion, or while attending to signals.

(7) He shall run his engine with extreme caution whenever men are being hoisted or lowered.

(8) He shall not hoist men out of, or lower men into, any mine or shaft, at a speed greater than the rate posted in the engine room by the superintendent of the mine.

(9) He shall inspect all hoisting machinery and safety appliances connected therewith, when and as directed by the mine superintendent, and shall report to him any defects found therein.

(10) After any stoppage of hoisting for repairs or for any other purpose, exceeding in duration twenty-four hours, he shall run a bucket, skip, cage, or other conveyance, on which no men shall ride, except for purposes of inspection, up and down the working part

of the shaft at least once, and shall not permit the bucket, skip, cage, or other conveyance to be used for hoisting or lowering men, until the hoisting machinery and shaft shall have been found to be in safe condition.

(11) He shall not land the bucket, skip, cage or other conveyance at the top of the shaft, but must hang the said conveyance at least ten feet above the collar of the shaft, or above any level before leaving his post.

(12) He shall familiarize himself with and carry out the requirements of all orders pertaining to the discharge of his duties.

(13) The superintendent shall post a copy of this order in a conspicuous place on the door of the engine house.

(14) Whenever men are working in a place to which they have been lowered by mechanical power, an engineer or a substitute must remain within hearing of the telephone and signal gongs while the aforesaid men remain in their working places.

(15) Hoisting engineers shall not permit the oilers to oil the engine while in motion, and shall exercise every care for the oilers' safety.

Order 1749. **Safeguards Against Overwinding.**

Headframe shall be of ample strength.

(*a*) The sheave carrying the hoisting rope shall be placed upon a headframe so designed as to resist a pull in the direction of the hoisting engine greater than the breaking stress of the hoisting rope employed.

(*b*) Some provision against overwinding, approved by the Industrial Accident Commission, shall be installed whenever the same will safeguard life.

Signal to warn hoisting engineer shall be used.

(*c*) The operator of every mine having a shaft over five hundred feet deep through which men are hoisted daily shall install a device which shall give a warning signal in the engine room whenever the cage or skip in ascending reaches a point one hundred feet below the collar of the shaft. The warning signal required by the terms of this section need not be installed if the hoisting engine be equipped with a device that will automatically stop the engine if the cage, skip or man car passes a certain point; *and provided, further,* that such automatic stopping device be kept constantly in good working order.

Such signal is not required if automatic overwinding device is used.

Order 1750. **Hoisting Ropes.**

Metal hoisting ropes are required.

(*a*) No operator of any mine shall use any rope or cable for hoisting or lowering men when such hoisting or lowering is done by any means other than human or animal power, unless such rope or cable shall be composed of metal wires, with a factor of safety determined as hereinafter set forth; *provided, however,* that such metal wires may be laid around a hemp center.

Hoisting ropes or cables shall have factor of safety as given in table.

(*b*) The factor of safety of all such ropes or cables shall be calculated by dividing the breaking strength of the rope as given in the manufacturer's published tables, by the sum of the maximum load to be hoisted, plus the total weight of the rope in the shaft when fully let out.

Hoisting rope safety factors for various depths of shafts shall conform with the table as given below:

Length of rope (vertical or incline)	Minimum factor of safety for new rope	Minimum factor of safety when rope must be discarded
500 feet or less	8	6.4
500 to 1000 feet	7	5.8
1000 to 2000 feet	6	5.0
2000 to 3000 feet	5	4.3
3000 feet and more	4	3.6

Use of small sheaves is forbidden.

(*c*) No head or angle sheave of a diameter less than sixty times the diameter of the rope shall be used for hoisting or lowering men when the included angle made by such rope at the sheave is ninety degrees or less.

Worn cables shall be promptly discarded.

(*d*) There shall not be used any rope or cable for the raising or lowering of men, either when the number of breaks in any running foot of said rope exceeds ten per cent of the total number of wires composing the rope, or when the wires on the crown of the strands are worn down to less than sixty per cent of their original area, or when the superficial inspection provided for in this section shows marked signs of corrosion. In all shafts containing acid waters, some acid-free preservative shall be regularly used upon the ropes.

Hoisting cables shall be regularly inspected.

(*e*) All ropes used for hoisting or lowering men shall be thoroughly inspected once in every week by some competent person designated for that purpose by the superintendent. If upon any inspection, such hoisting rope or cable shall be found to be below the requirements set forth in this section, it shall be disused for such purpose forthwith.

Two turns of hoisting rope must always remain on drum.

(*f*) Every rope used for hoisting or lowering men shall be securely fastened at both ends, and when in use shall never be fully unwound; at least two full turns shall remain always on the drum or reel. The end of the rope attached to the conveyance in the shaft shall either be securely fastened within a tapered socket or else it shall be bound around an oval thimble and then fastened to itself by splicing or by the use of three or more clamps.

(*g*) The superintendent shall cause an examination to be made once in every succeeding three months of all

hoisting rope or cable in use for hoisting and lowering men and materials, by cutting off from the lower end of such rope a section not less than five feet in length, and having such section examined carefully both externally and internally for crystallization, corrosion and breaks.

Order 1751. **Cages for Hoisting Men.**

Bonneted cages are required in vertical shafts.

(*a*) No operator of any mine shall permit the hoisting or lowering of men through a vertical shaft deeper than fifty feet, unless an iron-bonneted safety cage or skip be used for the hoisting and lowering of such men, but this provision shall not apply to shafts in process of sinking.

Construction of man cages or skips.

(*b*) It shall be the duty of the operator to have all cages or skips in which men are hoisted and lowered, used in vertical shafts over fifty feet deep, constructed as follows, or in a manner equally safe: The bonnet shall be of two steel plates three-sixteenths of an inch in thickness, sloping toward each side, and so arranged that they may be readily pushed upward to afford egress to persons therein, and such bonnet shall cover the top of the cage or skip in such manner as to protect persons on it from objects falling in the shaft. The cage or skip shall be provided with sheet iron or steel side casing not less than one-sixteenth of an inch thick, or with a netting composed of wire not less than one-sixteenth of an inch in diameter. The maximum size of openings of wire netting in any direction shall not be greater than two inches, and not less than five feet in height, and with gates of not less than four and one-half feet in height, and made of such materials as specified for the side casing, either hung on hinges or working in slides. Every man cage shall have overhead

bars of such arrangement as to give every man thereon an easy and secure handhold. Every cage or skip used in such shafts shall be provided with safety catches of sufficient strength to hold the cage or skip with its maximum load at any point in the shaft in the event that the hoisting cable should break.

Safety catches required in vertical shafts.

(*c*) It is expressly forbidden to place boards across the tops of skips and permit men to ride thereon. It is also forbidden to permit men to stand on the edges of the tops of such skips for the purpose of being hoisted or lowered. The superintendent shall designate the number of men who may safely ride on the bail of a skip in inclined shafts and this number shall not be exceeded.

Special requirement.

(*d*) The conductor, cage tender or cage rider required by the terms of order 1746 (*c*) shall, when men are being hoisted and lowered, see that the gates of the cage are closed before giving the signal to move the cage and shall be responsible for their closing.

Cage gates must be closed.

(*e*) No person shall be permitted to ride upon or below any cage, car, skip or bucket that is loaded with powder, except for the purpose of unloading such powder.

Order 1752. **Oiling Cage Safety Catches, Etc.**

(*a*) The safety catches of cages and skips shall be kept well oiled and in good working order; they shall be tested at least once each two weeks, by tying up cage with hemp rope, lowering a few feet of hoisting cable on top of cage, then cutting the hemp rope; *provided,* that any other system of testing, which is equally effective may be used after securing the approval, in writing, of the Industrial Accident Commission.

Safety catches and sheave wheels must be regularly oiled and tested.

(*b*) Sheave wheels shall be daily inspected and properly oiled.

Order 1753. **Hoisting While Sinking Shaft.**

Precaution for lowering when shaft sinking.

(*a*) In no case shall a cage, skip, bucket, or other vehicle be lowered directly to the bottom of the shaft when men are working there, but such cage, skip, bucket, or other vehicle shall be stopped at least fifteen feet above the bottom of such shaft, until the signal to lower farther shall have been given to the hoisting engineer, by one of the men at the bottom of the shaft.

Order 1754. **Deepening Shaft—Protection.**

Men must be protected by bulkheads.

(*a*) During shaft-sinking operations in shafts steeper than thirty-five degrees from the horizontal, no other work in any other place in the shaft shall be executed, nor shall any material or tools be hoisted or lowered from or to any other place in the shaft while men are at work in the bottom of the shaft, unless the men so at work be protected from the danger of falling material by a securely constructed covering, sufficient closable openings being left for the passage of men and the bucket or other conveyance used in the sinking operations.

Order 1755. **Telephone System in Mines.**

An act providing for the establishment and maintenance of a telephone system in mines and prescribing a penalty for the violation thereof.

(Approved June 13, 1913.)

The people of the State of California do enact as follows:

Section 1. In all mines operated and worked in this state, where a depth of more than five hundred feet

underground has been reached, a telephone system must be established, equipped and maintained by the owners or lessees thereof with stations at each working level below the depth aforesaid, communicating with a station thereof on the surface of any such mine.

Telephones are required in mines five hundred feet deep.

SEC. 2. The failure or refusal of any owner or lessee to install or maintain such telephone system shall be deemed guilty of misdemeanor and punished accordingly.

Order 1756. **Telephones.**

Telephones shall be installed in all mines operated through tunnels or adits having a length of one thousand feet or more.

Order 1757. **Signals.**

(*a*) Every shaft, if exceeding fifty feet in depth, shall be provided with an efficient means of interchanging distinct and definite signals between the top of the shaft and the lowest level and the various intermediate levels from which hoisting is being done.

Signaling devices required in shafts.

(*b*) Special care shall be taken to keep the signaling apparatus in good order, and all proper precautions shall be taken to prevent electric signal and telephone wires from coming into contact with other electric conductors, whether insulated or not.

Order 1758. **California Mine Bell Signals.**

(*a*) Every person, company, corporation, or individual, operating any mine within the State of California—gold, silver, copper, lead, coal, or any other metal or substance—where it is necessary to use signals by means of bell or otherwise, for shafts, inclines, drifts,

crosscuts, tunnels, and underground workings, shall adopt, use, and put in force the following system or code of mine bell signals:

1 bell, to hoist.
1 bell, to stop if in motion.
1 bell, to release skip.
2 bells, to lower.
3 bells, man on; run slow.
7 bells, accident.
3-2-1 bells, ready to shoot in the shaft.

After signal "Ready to shoot in shaft," engineer must give his signal when he is ready to hoist. Miners must then give the signal of "Men to be hoisted," then "spit fuse," get into the bucket, and give the signal to hoist.

Engineer's signal, that he is ready to hoist, is to raise the bucket or cage two feet and lower it again.

Levels shall be designated and inserted in notice hereinafter mentioned.

(*b*) For the purpose of enforcing and properly understanding the above code of signals, the following orders are hereby established:

(*c*) In giving signals make strokes on bell at regular intervals. The bar (—) must take the same time as for one stroke of the bell, and no more. If timber, tools, the foreman, bucket or cage are wanted to stop at any level in the mine, signal by number of strokes on the bell, number of level first before giving the signal for timber, tools, etc. Time between signals to be double bars (— —).

(*d*) No person must get off or on the bucket or cage while the same is in motion. When men are to be hoisted give the signal for men. Men must then get on bucket or cage, then give the signal to hoist. Bell cord must be in reach of man on bucket or cage at stations.

(*e*) All timbers, tools, etc., not rigidly held, longer than the depth of the bucket, skip, cage or other conveyance, to be hoisted, or lowered, must be securely lashed at the upper end to the cable. Employees must know they will ride up or down the shaft without catching on rocks or such timbers and be thrown out.

(*f*) The foreman will see that one printed sheet of these signals and orders for each level, and one for the engine room, are attached to a board not less than twelve inches wide by thirty-six inches long, and securely fasten the board up where signals can be easily read at the places above stated.

Order 1759. **Special Signal Boards.**

(*a*) In addition to posting the full signal code there shall be placed at each station a sign board on which shall be displayed the designation of the station, and where station signals are used, the bell signal corresponding. Special signal boards required at shaft stations.

ELECTRICAL ORDERS.

These orders shall apply to underground electrical equipment and conductors or similar equipment partially underground and partially on the surface.

Electrical Utilization Safety Orders shall apply to all surface equipment.

Order 1760. **Definitions.**

(*a*) *Potential.*—The terms "potential" and "voltage" are synonymous and mean electrical pressure.

(*b*) *Difference of potential.*—The expression "difference of potential" means the difference of electrical pressure existing between any two points of an electrical system or between any point of such a system and the earth as determined by a voltmeter.

(*c*) *Potential of a circuit.*—The potential or voltage of a circuit, machine, or any piece of electrical apparatus is the potential normally existing between the conductors of such circuit or the terminals of such machine or apparatus.

(*d*) Where the conditions of the supply of electricity are such that the difference of potential between any two points of the circuit can not exceed three hundred volts, the supply shall be deemed a low-voltage supply.

(*e*) Where the conditions of the supply of electricity are such that the difference of potential between any two points of the circuit may at any time exceed three hundred volts, but can not exceed six hundred fifty volts, the supply shall be deemed a medium-voltage supply.

(*f*) Where the conditions of the supply of electricity are such that the difference of potential between any two points of the circuit may at any time exceed six hundred fifty volts, the supply shall be deemed a high-voltage supply.

(*g*) *Grounding.*—Grounding any part of an electrical system shall consist in so connecting such part to the earth that there shall be no material difference of potential between such part and the earth.

(*h*) *Underground station.*—The term "underground station" as used herein shall mean any place where electrical machinery is permanently installed in the mine.

(*i*) *Carrying capacity.*—The term "carrying capacity" shall be taken to mean the carrying capacity of a given wire as prescribed for various insulated wires in the National Electric Code, published by the National Board of Fire Underwriters.

Order 1761. **Notice of Electrical Installation.**

(*a*) Whenever any permanent electrical installation of medium or high voltage, in excess of twenty-five kilowatts, is to be introduced into any mine or mine plant, notices thereof in writing, with plans and specifications, shall be sent to the Industrial Accident Commission as early as possible before such installation is begun.

Order 1762. **Care of Equipment and Practices.**

(*a*) No person working in or about a mine shall wilfully cause another person to receive an electric shock.

(*b*) No person shall, without authority, handle electric wires or conductors, or electrical apparatus of any kind, or enter an electrical machine room or underground station.

Inexperienced persons shall not work with electricity.

(*c*) No person shall be allowed to work on or with electrically driven apparatus, unless he shall have been previously instructed in the performance of his duties by a competent person and shall have been duly authorized by the mine superintendent or mine foreman.

(*d*) No repairing of any electrical apparatus shall be done when the current is on, except by an electrician in case of apparatus of less than one hundred and fifteen volts.

(*e*) Electric lights underground shall not be installed save by a competent person to be designated or appointed by the mine foreman.

Electricians shall be instructed in methods of resuscitation.

(*f*) Instructions for the resuscitation of persons suffering from electric shock shall be posted at the entrance to the mine, in every generating station or substation, and in all underground electric stations. All employees working with electrical apparatus shall be required by the mine superintendent to familiarize themselves with these instructions, and shall be capable of applying them before entering upon such work.

(*g*) No person shall wilfully damage or without proper authority shall alter or make connections to any electrical lines or conductors, machines, apparatus, or parts thereof, used in connection with the supply or use of electricity.

Order 1763. **Grounding.**

(*a*) The frames and bed plates of generators, transformers, compensators, rheostats, and motors, installed underground shall be effectively grounded. All metallic coverings, armoring of cables, other than trailing cables, and the neutral wire of three-wire systems shall also be so grounded.

Frames of underground electrical apparatus shall be grounded.

Voltage.

(*b*) No higher voltage than medium voltage shall be used underground, except for transmission or for application to transformers, motors, or other apparatus in which the whole of the high-voltage circuit is stationary.

Use of high voltages restricted.

Ground Detectors.

(*c*) All circuits leaving switchboard in underground stations, and all circuits leaving switchboard upon the surface and leading underground, shall, if circuits are completely insulated from the earth, be equipped with earth or fault detectors properly installed. Such detectors shall be inspected daily by a competent person, who shall report promptly to the superintendent of the mine the occurrence of any ground.

Ground detectors required on certain circuits.

Switchboards.

(*d*) Main and distribution switch and fuseboards shall be made of noncombustible, nonabsorbent, insulating material, which shall be free from metallic veins. The board shall be mounted upon supporting frameworks of iron or steel and fixed in a dry place. If insulated conductors are used in the wiring of the board, the insulation of such conductors shall be flameproof.

Specifications for switch and fuse boards.

Danger Signals.

(*c*) All high-voltage machines and apparatus shall be marked by the use of the word "danger."

Fire Buckets.

Fire protection required in electrical stations.

(*f*) Buckets filled with clean, dry sand shall be kept in all underground electrical stations ready for immediate use in extinguishing fires. The minimum quantity of sand thus stored in any one station shall be two cubic feet; *provided,* that a Pyrene extinguisher, or equal, may be kept instead of the sand.

Emergency Lights.

Lights in underground stations.

(*g*) Lamps or other proper lights shall be kept ready for use in all underground stations where a failure of electric light is likely to cause danger.

Plan of Electric System.

Map of underground electrical equipment required.

(*h*) The operator of every mine where electrical equipment is installed underground shall make or cause to be made by a competent person, a clear and accurate plan, or sketch with distances marked, showing the position of all stationary electrical apparatus in connection with the mine, in excess of twenty-five kilowatts or medium voltage, including fixed cables, conductors, lights, switches and trolley lines. The capacity in horsepower of each motor and in kilowatts of each generator or transformer, and the nature of its duty, shall be shown on such plan or sketch. This plan or sketch shall be kept at the mine and shall be corrected and be brought up to date at intervals of not exceeding six months, and shall at all times be subject to examination by the chief mining engineer or a mining engineer.

Report of Defective System.

(*i*) A report shall be promptly made to the mine superintendent or mine foreman of every breakdown of any part of the electrical equipment in the mine, or of damage or injury thereto, or of any overheating, or of the appearance of sparks or arcs outside of the inclosing casings, or when any part of the equipment, not a part of the electrical circuit becomes alive. It shall be the duty of the person first observing such breakdown, injury, damage, sparking, arcing, or the fact that some part of the equipment, not so supposed to be, is alive, to make such report or to communicate such fact to the person in charge of the equipment in question, who shall thereupon make such report as prescribed.

Defective electrical apparatus must be reported.

Order 1764. Underground Stations and Transformer Rooms.

(*a*) *Switchboards.*—All switches, circuit breakers, rheostats, fuses, and instruments used in connection with underground motor generators, rotary converters, transformers, and motors, shall be mounted on standard bases of noncombustible and insulating material, but in no case shall primary instruments be used. This provision shall not apply to compensators for induction motors. The above mentioned switches, circuit breakers, rheostats, fuses, and instruments may be mounted on a common base, provided such base is of noncombustible, insulating material.

Noncombustible insulating material is required for switch bases.

(*b*) *Passageways.*—A passageway not less than three feet in width shall be maintained in front of all switchboards, and behind all switchboards more than thirty inches wide, installed underground, after these orders go

Passageways required in front of and back of switchboards.

into effect; *provided, however,* that in the case of high-voltage boards such passageways shall not be less than four feet in width. In cases of old installations which do not meet the requirements of this paragraph, no one shall be permitted back of the switchboards while the current is on.

Space back of high-voltage switchboards shall be kept locked.

(*c*) *Space back of switchboards.*—The space at the back of switchboards, over thirty inches wide, shall be accessible from each end, and shall be kept locked up in case of high-voltage boards, but no lock shall be used that will not permit the door being opened from the inside without the use of a key. In no case shall this space be used as a change room, wardrobe or for the storage of material. Noncombustible flooring only shall be used at the front and back of high-voltage boards, and insulating mats or their equivalent shall be provided in front and back of all boards, whatever the voltage.

(*d*) *Conductors crossing passageway.*—No electric conductor shall cross a passageway at the back of a switchboard except below the floor, or at a height of not less than seven feet above the level of the floor.

(*e*) *Live metal work on switchboards.*—No live metal work shall be placed on the front of high-voltage switchboards within seven feet of the floor.

(*f*) *Protection of terminals.*—All exposed terminals on underground machines shall be protected with properly designed insulating covers of suitable material, or with metal covers connected to earth.

(*g*) *Transformer rooms.*—Transformer rooms shall be properly lighted, shall be of fireproof construction, and if of conductive material shall be effectively grounded.

(*h*) *Circuits entering or leaving all transformers.*— Circuits leaving a transformer shall be protected by a switch and an automatic circuit breaker to interrupt current, but fuses may be substituted for the circuit breakers in the case of lighting circuits, and in the case of power circuits transmitting twenty-five kilowatts or less. Primary fuses and disconnecting switches shall be placed in the primary circuit ahead of the transformers, but in no case shall these disconnecting switches be opened or closed under load.

Switches and automatic circuit breakers are required near transformers.

Order 1765. TRANSMISSION LINES AND CABLES.

High-voltage Wires.

(*a*) All high-voltage wires installed underground after these orders are adopted, shall be in the form of insulated lead-covered cables, which shall be armored or effectively protected against abrasion, but the armor shall be electrically continuous throughout, and shall be effectively grounded. The installation of efficiently insulated wires in metal conduit to transmit power underground, shall be considered to meet this requirement.

Armor required for high-voltage underground wires.

Support of Cables and Wires.

(*b*) All underground cables and wires, unless provided with grounded metallic covering, shall be supported by efficient insulators. The conductors connecting lamps to the power supply shall in all cases be insulated.

Insulation and support of conductors.

(*c*) Cables and wires unprovided with metallic coverings shall not be fixed to walls or timbers by means of uninsulated fastenings.

Overhead Lines Above Ground.

Efficient insulators and lightning arresters required.

(*d*) Overhead transmission lines between the generating station or substation and the mine entrance, shall be supported upon insulators, which shall be adequate in quality, size, and design for the voltage transmitted. Where such line is more than five hundred feet in length, lightning arresters shall be installed in connection therewith at the entrance to the mine. Such line except in the case of trolley wires, shall be maintained not less than fourteen feet above the ground at the lowest point, except at the point of entrance to the mine.

Buried Cables.

Insulation of buried cables.

(*e*) Buried cables shall be continuously insulated, and protected by a metallic sheath, preferably lead; and where they are so located that there is a possibility of danger to the sheath by puncturing, such cables shall be further protected by armor.

Protection of Circuits Leading Underground.

Switches and circuit breakers.

(*f*) Every completely insulated feeder circuit in excess of twenty-four kilowatt capacity, leading underground, where the supply does not exceed the limits of a medium-voltage supply, shall be provided above ground with a switch and an automatic overload circuit breaker. In the case of ground-return direct current circuits, a switch and current breaker shall be installed in the ungrounded side of the circuit, but may be omitted from the return side. Fuses may be substituted for circuit breakers in circuits transmitting twenty-five kilowatts or less.

(*g*) Every high-voltage alternating-current feeder circuit leading underground shall be provided above ground with an oil break switch on each phase, and every such switch shall be equipped with an automatic overload trip.

Branch Circuits.

(*h*) Every branch circuit shall be provided with a switch of ample carrying capacity, on each phase, within fifty feet of the point where it leaves the main circuit. Switches on branch circuits.

Lighting Circuits.

(*i*) Wires for all lighting circuits shall be covered with an insulation adequate for the voltage of the circuit, and, unless encased in pipes or other metallic covering, shall be strung on porcelain or glass insulators. Separate uncased wires shall be kept at least three inches apart, except where they enter the fittings. Metallic casings, if used, shall be efficiently grounded. Insulation and support of lighting circuits.

Underground Trolley.

(*j*) Trolley wires shall be installed as far to one side of underground workings as is practicable, and shall be securely supported upon hangers efficiently insulated, and placed at such intervals that the sag between points of support shall not exceed three inches.

Protection of Trolley Wires.

(*k*) At all places where men are required to work or pass regularly under trolley or other bare power wires which are placed less than six and one-half feet above top of rail, a suitable protection shall be provided, which may consist of channeling the roof or of Trolley wires boxed in and places lighted.

placing boards along the wire, which shall extend three inches below it, the spacing between boards not to exceed four and one-half inches, or in the use of any other device that will afford ample protection. In new installations the trolley wires shall be protected as provided for above unless the wire is at least seven feet above top of rail. At all points where timbers or tools have to be unloaded or transferred up a raise, the trolley wires shall be boxed or otherwise protected as provided for in this paragraph. All places where it is required that the trolley wires shall be boxed, shall be well lighted with electric lamps.

Protection of other wires.

(*l*) All wires, except telephone, shot-firing and signal wires, shall be on the same side of the working as the trolley wire, and shall be boxed or otherwise protected when timbers or tools have to be transferred up a raise.

Power Wires and Cables in Shafts.

Special supports are required for power cables in shafts.

(*m*) In all shafts, the angle of inclination of which is above forty-five degrees from the horizontal, and in all hoisting shafts or manway compartments, all power wires and cables shall be highly insulated and substantially fixed in position. All shaft cables shall be supported on insulators that can not cause abrasion of the covering or insulation, so spaced that no part of the cable shall be under a tension greater than one-fourth of its ultimate strength. The cable shall be held in position at points between the insulators by grips or cleats that can not cause abrasion of the covering or insulation. Where the cables are not completely boxed in and protected from falling material, space shall be left between them and the side of the shaft so that they

may yield and lessen a blow from falling material. This order shall not be construed to prevent the installation of efficiently insulated wires in metal conduit, to transmit power underground.

Cables in Main Roads.

(*n*) Where the cables or feed wires in main roads can not be kept at least twelve inches from any part of the mine car or locomotive, they shall be specially protected by proper guards. Protection of cables.

Protection of Cables During Blasting.

(*o*) Cables shall be temporarily protected against damage at any point where workings are being repaired or where blasting is being carried on.

Cables Entering Fittings.

(*p*) The exposed ends of cables where they enter fittings of any description shall be so protected and finished off, that moisture can not enter the cable, or the insulating material leak out, if of an oily or viscous nature. Cable connections.

(*q*) Where unarmored cables or wires pass through metal frames or into boxes or motor casings, the holes shall be substantially lined with insulating bushings.

Joints in Conductors.

(*r*) All joints in conductors shall be mechanically and electrically efficient, and shall be soldered wherever necessary. All joints in insulated wire shall, after the joint is complete, be re-insulated to the same extent as the remainder of the wire. Connections must be insulated.

Joints in Cables.

Cable junction boxes.

(*s*) Where cables are joined, suitable junction boxes shall be used, or the joints shall be soldered, and the insulation, armoring, or lead covering replaced in as good condition as it was originally.

Order 1766. Fuses, Circuit Breakers, and Switches.

Efficiency of circuit breakers.

(*a*) Fuses and automatic circuit breakers shall be constructed so as effectually to interrupt the current when a short circuit occurs or when the current through them exceeds a predetermined value. No open type or link fuses shall be used.

Switches.

(*b*) All points at which a circuit has to be made or broken, shall be provided with proper switches, which shall be so installed that they can not be closed by gravity.

Fuses.

(*c*) Fuses shall be stamped or marked, or shall have a label attached, indicating the maximum current that they are intended to carry. Fuses shall be adjusted or replaced only by an authorized and competent person.

(*d*) The capacity of fuses used to protect feeders shall not exceed the current capacity of the feeder by more than twenty-five per cent.

(*e*) All switches, circuit breakers, and fuses shall have noncombustible bases.

Order 1767. Stationary Motors.

Circuit breaking devices.

(*a*) Every stationary motor and every portable motor underground, together with its starting device, shall be protected by a fuse on each phase or (in the case of

motors of more than forty horsepower) by a circuit breaking device on at least one phase of direct current motors and on each phase of alternating current motors, and by switches arranged to cut off entirely the power from the motor. The above devices shall be installed in a convenient position near the motor and in sight of it.

Order 1768. **Electric Lighting.**

(*a*) *Lamp sockets.*—The exterior of the sockets of all fixed incandescent lamps shall be entirely nonmetallic. Non-metallic lamp sockets.

(*b*) *Flexible lamp cord.*—The use of flexible lamp cord for lighting connections is prohibited, except for portable incandescent lights to be used in connection with the inspection and repair of machinery and equipment, and in that case the cord shall be specially insulated and armored. Such portable lights shall be protected by a wire cage large enough to inclose both lamp and socket and shall be provided with a handle to which the light and socket shall be firmly attached and through which the leading-in wires shall be carried. Special lamp cord required underground.

(*c*) *Incandescent lamps.*—Incandescent lamps shall be so placed that they can not come into contact with combustible material; and shall be so placed that an adequate circulation of air may take place on all sides of them. Location of electric lamps.

Order 1769.

General Safety Orders issued by the Industrial Accident Commission of the State of California shall apply. Adopted November 1, 1915. Effective January 1, 1916. (Copy mailed on application to Industrial Accident Commission.)

Order 1770.*

(*a*) Air Pressure Tank Safety Orders issued by the Industrial Accident Commission of the State of California shall apply. Adopted December 4, 1916. Effective January 1, 1917. (Copy mailed on application to the Industrial Accident Commission.)

Order 1771. **Underground Restraining Dam.**

(*a*) No restraining dam shall be installed in any mine where the rupture of such dam would imperil the safety of men in said mine or other mine until the Industrial Accident Commission has given its approval for the construction of said dam.

Order 1772. **Transportation.**

(*a*) Where mechanical haulage is used, all frogs shall be properly blocked.

(*b*) Employees shall not be allowed to ride on cars, where mechanical haulage is used, unless specifically authorized to do so by the superintendent or his assistants.

(*c*) Lights shall be kept on the front of all moving trains.

---

*Commission recommends that a fusible plug be inserted in the air line between the compressor and air receiving tank.

Order 1773. ENGINE SAFETY ORDERS.

Order 100.

(*a*) All stationary steam engines, gas engines, air compressors, electric generators and pumps must have all gears, belts, pulleys, clutches, shafts, keys and key-seats, collars, set screws and sprockets guarded according to the orders as set forth in General Safety Orders issued by this Commission. (Portable engines and pumps, such as logging engines, portable hoisting engines and engines and pumps used in construction work are not classed as stationary engines.)

Order 101.*

(*a*) Each engine must be equipped with an effective governor which will at all times automatically control the speed of the engine under varied loads, except where the load itself acts as an effective governor. All belt, rope or chain-driven governors must be equipped with a safety device which will stop the engine in case the belt, rope or chain should break.

(*b*) Projecting rotating parts of all engine governors shall be provided with substantial guards.

Order 102.*

(*a*) Valve gears must be so arranged, or other provisions made, that in the event of the load being removed, the engine will stop if the governor fails to act. (A broken governor belt stop will be considered sufficient for slide or four-valve engines.)

*It is recommended that each engine shall be equipped with an automatic stop, independent and a complete unit in itself.

Order 103.

(*a*) All parts of engine room not accessible from the floor and requiring attention must be provided with adequate runways, rough tread platforms, or rough tread stairways.

(*b*) Where stairways are not practicable, fixed ladders must be installed, the rounds of which shall be not less than six (6) inches in clear from wall or column. (The use of metal ladders is strongly advocated.)

(*c*) The protection of platforms and runways shall be in accordance with Order 13 of the General Safety Orders.

Order 104.

(*a*) No repairs must be made on any vertical or horizontal engine, compressor or pump until the engine has been securely blocked, or other provisions made to prevent revolving or reciprocating parts from turning over accidentally.

Order 105.

(*a*) Wherever floors, stairways or platforms in engine rooms become slippery, they shall be equipped with rough surface plates or treads.

Order 106.

(*a*) In engine rooms all floor openings must be protected by a substantial covering or be guarded in accordance with Order 17 of the General Safety Orders. (The use of rough tread metal plates is advocated for floor opening covers.)

Order 107.

Flywheels on stationary steam engines, gas engines, air compressors, electric generators and pumps must be guarded as follows:

(*a*) If guard is at least fifteen (15) inches and not more than eighteen (18) inches in the clear from each side and face of the wheel, a fence may be used at least three and one-half (3½) feet high, consisting of two rails, the bottom rail of which must be at a point eighteen (18) inches from the floor, and no rails shall be spaced a greater distance than twenty-four (24) inches between centers.

(*b*) If guard is less than fifteen (15) inches in the clear from each side, and each face of the wheel, a substantially supported wire mesh or close slat guard with openings not greater than two (2) inches in any direction, must be provided at least to the top of the wheel, if the wheel does not extend over five (5) feet in height, and in no case shall this guard be less than three and one-half (3½) feet high. If the top of the wheel is more than five (5) feet in height, the guard must be at least five (5) feet high.

(*c*) All flywheel pits must be surrounded with toe-boards not less than six (6) inches high.

(*d*) In case the above method of protection is not desired, flywheels must be housed completely with substantially supported wire mesh, close slats or solid material.

(*e*) Where it is necessary to move flywheels for starting, guards may be removed temporarily, but must be replaced immediately after such operation is complete.

(*f*) All rope-drive wheels and pulleys from main engine to jack-shaft must be covered with a substantial housing to prevent lashing of broken rope.

(*g*) Every engine transmitting power by means of a rope drive must be equipped with a telltale which will give ample warning of the stranding of the ropes.

Order 108.

(*a*) All cranks and connecting rods of center crank engines and of high speed side-crank engines, shall be equipped with a complete and substantial metal housing which may be provided with doors where necessary.

(*b*) All slow speed side-crank engines shall be provided with a guard at least fifteen (15) inches in the clear from the crank pin, and at least three and one-half (3½) feet high.

Order 109.

(*a*) Two exits shall be provided for each engine room, said exits to readily open from the inside without the use of a key.

(*b*) In engine rooms below ground level, at least one exit must be isolated from the engine room by a fireproof enclosure, the entrance of which must be provided with a door at floor level.

NOTE.—The intent is to protect operators against scalding or suffocating vapors or gases.

(*c*) All engine rooms shall be properly ventilated to prevent the accumulation of noxious vapors, odors and fumes.

Order 110.

(*a*) All trenches, tunnels and pits in engine rooms and leading therefrom shall have proper drainage and ventilation and be kept in a sanitary condition.

(*b*) All sumps and sewage tanks in engine rooms shall be tightly covered and ventilated to the outside atmosphere, using a vent not less than four (4) inches in diameter, and so located as not to endanger the safety of anyone in the vicinity.

Order 111.

(*a*) All traps, drains and trap discharges from engines shall be piped to a line, blow-off tank or other safe place of discharge.

(*b*) The discharge of all engine exhaust pipes must be located so as not to endanger the safety of anyone in the vicinity.

Recommendations.

It is recommended that every ammonia refrigerating plant maintain in good order a helmet or other similar device approved by this Commission for use in case it is necessary to enter the room in the presence of excessive ammonia fumes, and that this device be kept in close proximity to the entrance, and on the *outside* of the compressor room.

Order 1774. **Boiler Safety Orders.**

Boiler Safety Orders issued by the Industrial Accident Commission of the State of California shall apply.

Adopted July 31, 1916. Effective January 1, 1917. (Copy mailed on application to the Industrial Accident Commission.)

Order 1775. **Hours of Labor in Mine, Underground Workings and Smelters.**

(Statutes 1913, Chapter 186.)

SECTION 1. That the period of employment for all persons who are employed or engaged in work in underground mines in search of minerals, whether base or precious, or who are engaged in such underground mines for other purposes, or who are employed or engaged in any other underground workings whether for the purpose of tunneling, making excavations or to accomplish any other purpose or design, or who are employed in smelters and other institutions for the reduction or refining of ores or metals, shall not exceed eight hours within any twenty-four hours, and the hours of employment in such employment or work day shall be consecutive, excluding, however, any intermission of time for lunch or meals; *provided,* that, in case of emergency where life or property is in imminent danger, the period may be a longer time during the continuance of the exigency or emergency.

SEC. 2. Any person who shall violate any provision of this act, and any person who as foreman, manager, director or officer of a corporation, or as the employer or superior officer of any person, shall command, persuade or allow any person to violate any provision of this act, shall be guilty of a misdemeanor and upon conviction shall be punished by a fine of not less than fifty dollars ($50.00) nor more than three hundred dollars ($300.00), or by imprisonment of not more than three months. And the court shall have discretion to impose both fine and imprisonment as herein provided.

SEC. 3. All acts and parts of acts inconsistent with this act are hereby repealed.

Order 1776. **Woodworking Safety Orders.**

Woodworking Safety Orders issued by the Industrial Accident Commission of the State of California shall apply. Adopted June 5, 1916, effective August 1, 1916. (Copy mailed on application to the Industrial Accident Commission.)

Appendix.

Workmen's Compensation, Insurance and Safety Act. (Copy mailed on application to the Industrial Accident Commission.)

INDEX.

A

	Page	Order	Subdivision
Abandoned drill holes, deepening forbidden	29	1713	4
Abandoned mine, maps must be filed	17	1705	b
Abandoned mines, upkeep of escapeways	40	1723	b
Abandoned mine shafts must be protected	30, 31	1714	1-2
Accidents and injuries must be reported	30	1713	15
Accidents, reports by employees	26	1711	a
Accumulations of water, protection against	46, 47	1734	a-b
Act: Drinking water	36	1719	1
Explosives	54-60	1742	1-16
Labor camp sanitation	32-35	1717	1-8
Fencing abandoned shafts	30, 31	1714	1-4
Hours of labor in mine, underground workings and smelter	102	1775	1-3
Mine exits	37, 38	1721	1-2
Reporting of fatal injuries by wire	20	1707	a
Telephone system in mines	78, 79	1755	1-2
Workmen's Compensation, Insurance and Safety, Appendix	103	----	--
Adits, telephones required	79	1756	--
Aerial tramways, oilers and inspectors only allowed to ride	27	1712	i
Air in mines to be kept pure	42, 43	1726	a, b
Air pressure tank safety orders	96	1770	a
Apparatus, oxygen mine rescue, men must be trained	16	1704	g
Apparatus, oxygen mine rescue, monthly inspections	15	1704	e
Apparatus, oxygen mine rescue, required	13	1704	a
Appendix, Workmen's Compensation, Insurance and Safety Act	103	----	--
Application of rules, defining mines covered	5	1700	a
Appointment of mine foreman	24	1709	a

B

Bar, loading at chutes	27	1712	f
Bell cord in reach required	81	1758	d
Belting guarded, required	31	1715	a
Blankets required	11	1703	a
Blasting, duties of foreman	65	1745	a
Blasting, duties of shot firers	65, 66	1745	a, e
Blasting, general	65, 68	1745	a, k
Blasting in shaft	80	1758	a
Blasting more than fifteen holes forbidden	67	1745	g

	Page	Order	Subdivision
Blasting, protection, wires	93	1765	o
Blasting warnings required	30	1713	13
Boiler safety orders	101, 102	1774	--
Bonnets on cages	76	1751	a, b
Bore holes approaching workings full of water	47	1734	b
Bore holes, extraction, explosives	66	1745	c
Boss or delegated employee required when men are in mine	27	1712	j
Bosses, duties, blasting	65, 66	1745	a, c
Boxes: Powder, instrument for opening	62	1743	g
Powder, opening in magazines prohibited	62	1743	g
Storage, of explosives in mine	61	1743	b
Bucket, crossheads required	48	1737	a
Number of men on	68	1746	b
Speed	69	1746	d
Used, hatches required	46	1732	b
Buildings covering escapeways	41	1724	a
Bulkheads required, sinking	78	1754	a
Bumper required on dump tracks	32	1716	a
Bunkhouses, sanitation act	32	1717	1

C

Cables. See hoisting ropes.			
Cables: Electric, buried	90	1765	e
Electric, in main roads	93	1765	n
Electric, in shafts	92, 93	1765	m
Electric, protection	93	1765	n, q
Electric, support of	89	1765	b, e
Cager shall be employed	69	1746	c
Cages: Construction, vertical shafts	76, 77	1751	b
Hoisting men, general	76, 77	1751	a, e
Tender must close gates	77	1751	d
Testing safety catches	76	1752	a
California mine bell signals	79-81	1758	a-f
Camp sanitation act	32-35	1717	1-8
Candles and lighting	50, 51	1740	a-d
Candle, extinguished end of shift	50	1740	a
Capping fuse	64	1744	d
Caps. See Detonators and Explosives.			
Act	55, 56	1742	3
Instantaneous electric in same round with delay action prohibited	67	1745	h
Storage and transportation	62	1743	e, f
Strength	65	1745	a

	Page	Order	Subdivision
Carbide, underground storage	51	1740	d
Care of equipment and practices, electrical	83, 84	1761	a, g
Care of the injured	11, 12	1703	a
Change houses	35	1718	--
Chief mining engineer, definition	6	1700	h
Chutes, dust allaying	50	1739	b
Circuit breakers, electric	94	1766	a, e
Circuit breakers, stationary motors	94	1766	a
Cleaning manways	44	1729	a
Closets required	36	1720	a
Code, mine bell signals	80	1758	a, c
Combustible rubbish underground	53	1741	f
Combustible substances, storage	64	1743	o
Conditions must be reported when dangerous	27	1712	d
Conductor, duties, cage or skip	77	1751	d, e
Construction: Ladders	48	1738	a, b
Large magazines, act	55	1742	3a
Man cages or skips	76, 77	1751	b
Small magazines, act	56	1742	3b
Transformer room	88	1764	g
Underground dam	96	1771	a
Contractors, application of orders	8	1700	o
Conveyance, hoisting timber, tools, etc.	81	1758	c
Cooperative mine rescue station; telephone communication	15	1704	c
Foreman required	14	1704	b
Coroner's evidence on fatal accidents	21	1707	53
Covering mine shafts, act	30, 31	1714	1, 2
Crimpers, use required	64	1744	c
Cross heads	47, 48	1737	a
Crossing shaft hoisting compartment forbidden	46	1732	c

D

Dam, underground, approval for construction required	96	1771	a
Danger; mine shafts to be covered, act	30, 31	1714	1, 2
Signals, mine foreman's duties	26	1712	b
Dangerous conditions to be immediately reported by operator or superintendent	9, 10	1701	b
Dangerous gas must be reported by superintendent	42, 43	1726	c
Dangerous machine, use prohibited by notice	19	1706	c
Dangerous machinery required guarded	31, 32	1715	a
Dangerous mines, engineer's procedure	17, 18	1706	a, b

	Page	Order	Subdivision
Dangerous places, mine foreman's duties	26	1712	b
Deepening shaft, protection	78	1754	a
Defective fuse, use forbidden	64	1744	f
Definitions: Application	5	1700	a
Chief mining engineer	5	1700	h
Electrical orders. See Electricity, definitions.			
Employees	8	1700	o
Excavations and workings	6	1700	j
Explosive	7	1700	l
Mine	5	1700	c
Mineral	5	1700	d
Mine foreman	6	1700	g
Mining engineer	6	1700	i
Number of men	6, 7	1700	k
Operator	6	1700	e
Person	7, 8	1700	m
Singular and plural numbers	5	1700	b
Superintendent	6	1700	f
Underground	8	1700	n
Designation for service of notices	10	1702	a
Detonators. See Caps and Explosives.			
Devices, mine bell signals required	79, 81	1758	a, f
Devices, signal, required in shafts	79	1757	a, b
Signal required, telephone act	79, 80	1755	1, 2
Distillate, storage	51	1741	a
Doors, fireproof required	41, 42	1725	a, b
Drifts; approaching accumulation water, protection	47	1734	b
Protected from falling material	45	1731	b
Drilling, dust required allayed	49	1739	a
Drilling near missed hole	66	1745	c
Drinking water; good quality, required	36	1719	1
State act	36	1719	1
Dry or water closets; construction	36, 37	1720	a
Disinfectants	36, 37	1720	a
Required	36, 37	1720	a
Dump tracks for waste must be kept in good condition; bumper and proper runway required	32	1716	a
Dust; ore houses, allaying	50	1739	d
Rock, required, allayed	49, 50	1739	a-d
Duties foreman: Blasting	65	1745	a
Electric lights underground, installation by competent person	84	1761	c
Electrically driven apparatus, person authorized	84	1761	c
Fencing off of dangerous places	26	1712	b
Hoisting, posting signals	81	1758	c

	Page	Order	Subdivision
Inspection of all working places	25	1710	f
Mine exits	27, 28	1712	k
Record of monthly fire drills	28	1712	k
Reporting of unsafe conditions	24	1710	a
Safety regulations	24	1710	a
Supervision over men	25	1710	a
Timber	44	1730	c
Duties, hoisting engineer	70–73	1748	1–15
Duties operator: Care of the injured	11, 12	1703	a
Change house	35	1718	--
Designation for service of notices	10	1702	a
Factor of safety of hoisting rope	74	1750	a, b
Ladders and ladderways	48, 49	1738	a–h
Notifying chief mining engineer upon resuming or starting new operations	10	1701	c
Oxygen mine rescue apparatus required	13	1704	a
Reasonable precautions to protect employees	26	1712	a
Sanitation, dry closets, drinking water	36, 37	1720	a, b
Supplying crimpers	64	1744	e
Supplying timber	44	1730	b
Warning signal for hoisting engineer	74	1749	c
Yearly reports to chief mining engineer	8, 10	1701	a, c
Duties of operator or superintendent, report dangerous conditions	9, 10	1701	b
Duties, shift boss, missed holes	66	1745	c
Duties, shot firers, blasting	65, 66	1745	a, e
Duties, skip or cage tender	77	1751	d
Duties, skip tender	69	1746	c
Duties, superintendent: Appointment of competent hoisting engineer	70	1747	a
Appointment of competent man in charge of explosives magazine	22	1708	b
Appointment of foreman	24	1709	a
Electrically driven apparatus, person authorized	84	1761	e
Electricians, instruction in methods of resuscitation	84	1761	f
Examination of hoisting ropes every three months	75, 76	1750	g
First aid	11, 12	1703	a, b
Fuse	64	1744	b
Hoisting, general	68–71	1746	a–f
Hoisting, to designate number men on skip bail	68, 69	1746	b
Hoisting, to post hoisting orders	73	1748	13
Hoisting engineer, physical examination	70, 71	1747	a
Hoisting ropes	74	1750	a

	Page	Order	Subdivision
Mine exits	27, 28	1712	k
Missed holes	65	1745	b
Number of men allowed to ride on bail of skip in inclined shafts	77	1751	c
Orders for underground men	28	1713	--
Reasonable precautions to protect employees	26	1712	a
Record of monthly fire drills	28	1712	k
Reporting of dangerous mine gas	42, 43	1726	c
Reports of defects to operator	22	1708	b
Roof inspection	43	1728	a, b
Safety committees	23, 24	1708	d
Safety inspections	22	1708	b
To appoint powder man	22	1708	b
Weekly shaft inspection reports	23	1708	c
Dynamite. See Explosives.			
Thawing	62, 63	1743	h, i

E

Electric caps, instantaneous and delay in same round prohibited	67	1745	h
Electric exploders, shaft sinking	68	1745	k
Electrical conductors, explosives near, prohibited	61	1743	b
Electrical orders, general	82–96	1760–1767	--
Electricity: Apparatus, repairing and precaution	84	1761	d
Armored conductors	89	1765	a
Branch circuits	91	1765	h
Buried cables	90	1765	e
Cable fittings	93	1765	p
Circuit breakers	90, 91	1765	f, h
Circuit breakers, fuses and switches	94	1766	a, e
Circuit breakers, stationary motors	94, 95	1767	a
Circuits entering or leaving all transformers	89	1764	h
Conductors crossing passageways	88	1764	d
Conductors in shafts	92, 93	1765	m
Conductors, joints	93, 94	1765	r, s
Danger signals	86	1763	e
Definitions	82, 83	1760	a, i
Carrying capacity	83	1760	i
Difference of potential	82	1760	b
Grounding potential	83	1760	g
High voltage supply	83	1760	f
Low voltage supply	82	1760	d
Medium voltage supply	82	1760	e
Potential	82	1760	a

	Page	Order	Subdivision
Potential of a circuit	82	1760	c
Underground station	83	1760	h
Emergency lights	86	1763	g
Equipment, care	83, 84	1761	a, g
Fire protection	86	1763	f
Fuses, circuit breakers and switches	94	1763	a, e
Fuses, protection of circuits	90	1765	f
Fuses, stationary motors	94, 95	1767	a
Grounding	85	1763	a
Ground detectors, inspection	85	1763	c
High voltage wires protected	89	1765	a
Inexperienced persons must not handle	84	1761	b, c
Insulation conductors	89	1765	b
Insulation, lighting circuits	91	1765	i
Lamps, cords and sockets	95	1768	a, c
Lightning arresters	90	1765	d
Lines overhead, surface	90	1765	d
Live metal work on switchboards	88	1764	c
Map of system	86	1763	h
Notice of installation	83	1761	a
Protection, conductors	92–94	1765	l–s
Protection during blasting	93	1765	o
Protection, high voltage feeders	91	1765	g
Protection, lamps	95	1768	c
Protection terminals	88	1764	f
Repairs	84	1761	d
Resuscitation	84	1761	f
Shock wilfully caused	83	1761	a
Shot-firing precautions	66, 67	1745	d, e, f
Space back of switchboards	88	1764	c
Stationary motors	94, 95	1767	a
Supports of conductors	89	1765	b, c
Switchboard construction	87, 88	1764	a, f
Switchboard passageways	87, 88	1764	b
Switchboard specifications	85	1763	d
Switches	94	1763	b, e
Transformer rooms, construction, lighting	88	1764	g
Transmission lines and cables	89-93	1765	a-s
Trolley wires, underground	91, 92	1765	j, k
Underground lights, installation by competent person	84	1761	1
Underground stations and transformer rooms	87–89	1764	a–h
Voltage underground	85	1763	b
Wires, tampering forbidden	29	1713	8
Elimination, rock dust	49, 50	1739	a, d

	Page	Order	Subdivision
Employees, definition	8	1700	o
Employment, solitary forbidden	26	1712	c
Engine safety orders: Cranks and connecting rods	100	1773	108a
Exhaust pipes, discharge	101	1773	111b
Flywheel pit, toeboards	99	1773	107c
Flywheels, guards	99	1773	107a, b
Flywheels, housed	99	1773	107d
Flywheels, starting guards must be replaced	99	1773	107e
Governor, belt, rope driven, safety device	97	1773	101a
Governor, required	97	1773	101a
Governors, guards for projecting rotating parts	97	1773	101b
Guards, general	97	1773	100a
Repairs, prevention of parts moving	98	1773	104a
Rope-driven wheel, guards	100	1773	107f
Side-crank, guards	100	1773	108b
Trap, drains, etc., discharge	101	1773	111a
Valve gears, governor fails to act	97	1773	102a
Engines burning fuel underground	52	1741	e
Engineer: Chief mining, definition	6	1700	h
Hoisting signal	80	1758	a
Mining, definition	6	1700	i
Engineer's procedure, dangerous mines	17, 18	1706	a, b
Escapeways: Mine exit act	37, 38	1721	1, 2
Only one outlet to surface	40, 41	1724	a
Only one outlet to surface, provision for development work	38, 39	1722	c
Through other mines	39, 40	1723	a, b
Excavations and workings, definition	6	1700	j
Exits. See Escapeways.			
Exits, act	37, 38	1721	1, 2
Exits: Inflammable houses prohibited	41, 42	1725	a, b
Ladders and ladderways	48, 49	1738	a, h
Only one outlet to surface	40, 41	1724	a
Through other mines	39, 40	1723	a, b
Two openings to surface	38, 39	1722	a, c
Experience required by superintendent	22	1708	a
Explosions, extraction from bore holes	66	1745	c
Explosions in blast counted	65	1745	b
Explosives: Act	54-60	1742	1-16
Appointment of competent man in charge of Magazine	22	1708	b
Definition	7	1700	1
Extraction from "missed" hole	29	1713	12
Inholes, procedure of miners	29	1713	4
Misses, holes must be reported	30	1713	14

	Page	Order	Subdivision
Near electrical conductors prohibited	61	1743	b
Orders for underground men	29, 30	1713	4,6,9,10,14
Removal without orders from mine or magazine	63	1743	1
Smoking while handling	29	1713	10
Special precautions, live electric wires	63	1743	k
Storage and use, general	60–64	1743	a-o
Storage in mine	61	1743	b
Tamping	30	1713	11
Transportation on electric locomotive under ground prohibited	63	1743	j
Transportation, storage and use	60–64	1743	a-o
Transportation with men	77	1751	e
Underground magazines	61, 62	1743	b-e
Extension ladders, shafts	49	1738	h
Extinguishers, electrical fires	86	1763	f

F

Factor of safety, hoisting ropes	74	1750	b
Failure to comply with orders	18	1706	b
Fatal injuries, investigation	21	1707	a
Fatal injuries must be reported to Commission by wire	19	1707	a
Fencing abandoned shafts, act	30, 31	1714	1–4
Fire protection at outlets	41, 42	1725	a, b
Fire protection, magazines	63	1743	m
First-aid corps, composition	11, 12	1703	a
Instruction	11, 12	1703	a
First-aid materials	11, 12	1703	a, b
Forbidden, getting on or off bucket or cage while same is in motion	80, 81	1758	d
Foreman, appointment	24	1709	a
Foreman, duties. See Duties.			
Foreman, mine, definition	6	1700	g
Foreman required for cooperative mine rescue station	14	1704	b
Fuse: Capping	64	1744	d
Defective, use forbidden	64	1744	f
Electric, capacity and construction	94	1766	a–e
General	64, 65	1744	a–h
Rate of burning, notice posted	64	1744	a–b
Special precautions	65	1744	h
Spitting, number by one man	67	1745	g
Storage, underground	65	1744	h
Warming	64	1744	g
Waterproofing	64	1744	c

G

	Page	Order	Subdivision
Gas, dangerous, report by superintendent	42, 43	1726	c
Gasoline, storage	51, 52	1741	a, b
Gasoline, use under ground	52	1741	d
Gas-tight doors	41, 42	1725	a, b
Gates, shaft protection	45	1732	a
Gears guarded	31	1715	a
General safety orders	96	1769	--
General safety precautions	26-28	1712	a-k
Gratings in square-set stopes	47	1735	a
Ground detectors, electrical	85	1763	c
Grounding electrical apparatus	85	1763	l
Grounding, electrical definition	83	1760	g
Guard rails, general	31, 32	1715	a, b
Guard rails, shaft protection	45	1732	a
Guard rails, square-set stopes	47	1735	a
Guarding places when blasting	65	1745	a
Guides, vertical shafts, crossheads required	47, 48	1737	a

H

Hand holds in ladderways	49	1738	e
Hatches required where buckets used	46	1732	b
Haulage, mechanical, refuge places	46	1733	a
Head frame required amply strong	73	1749	a
High voltage, electrical, definition	83	1760	f
High voltage wires, protection	89	1765	a
Hoisting, cager or skip tender required	69	1746	c
Hoisting compartments, incline shafts, special precautions	70	1746	f
Hoisting, general	68-71	1746	a-h
Hoisting engineer: Appointment	70	1747	a
Duties	70-73	1748	1-15
Must be competent	70, 71	1747	a
Physical examination required	70, 71	1747	a
Hoisting men, general	68-70	1746	a-f
Hoisting men allowed to ride on bail of skip	30	1713	18
Hoisting men in skips, special requirements	77	1751	c
Hoisting men, maximum rates of speed	68	1746	a
Hoisting men, mine bell signals	79-81	1758	a-e
Hoisting men, number allowed to ride on bail of skip in inclined shafts	77	1751	c
Hoisting men with explosives	77	1751	e
Hoisting, number men on skip bail	68, 69	1746	b
Hoisting, overwinding device	73	1749	b

	Page	Order	Subdivision
Hoisting ropes: General	74-76	1750	a-g
Babbitted, special inspection	75, 76	1750	g
Discarding worn	75	1750	d
Fastening	75	1750	f
Inspection	75	1750	e
Safety factor	74	1750	a, b
Size of sheaves	75	1750	c
Hoisting, shaft sinking	78	1753	a
Hoisting signals	79-81	1758	a-f
Hoisting special requirement	77	1751	c
Hoisting timber, tools, etc.	81	1758	e
Hoisting with bucket, crossheads required	47	1737	a
Hoisting with bucket, cage or skip, open hook prohibited	70	1746	g
Hoisting with bucket, speed	69	1746	d
Hours of labor in mine, underground workings and smelters, state act	102	1775	1-3
Houses, inflammable, over escapeways	41, 42	1725	a, b
Housing and sanitation act	32-35	1717	1-7

I

Incline shaft: Number of men allowed to ride on bail of skip	77	1751	c
Skip tracks	69, 70	1746	c
Special precautions	70	1746	f
Inclined ladders	49	1738	c-g
Inflammable gas must be reported by superintendent	42, 43	1726	c
Inflammable houses, over escapeways	41, 42	1725	a, b
Inflammable material, general	51-54	1741	a-i
Inflammable material near mine openings	53	1741	g
Inflammable substances near magazines	64	1743	o
Inflammable substances, storage	64	1743	o
Injunction, unsafe place of employment, violation of safety orders	18, 19	1706	c
Injured, care	11	1703	a
Injuries, record filed in mine office	26	1711	a
Injuries, reports by employees	26	1711	a
Injuries required reported	30	1713	15
Inspection by foreman	25	1710	b
Inspection by superintendent	22	1708	b
Inspection, escapeways between mines	40, 41	1723	a
Inspection, hoisting ropes	75, 76	1750	c-g
Inspection monthly, mine rescue apparatus	15	1704	e

	Page	Order	Subdivision
Inspection, roof	43	1728	a, b
Inspection, shaft weekly	23	1708	e
Inspection, sheave wheels, oiling	77, 78	1752	a, b
Instruction, first-aid corps	11, 12	1703	a
Investigation of fatal injuries	21	1707	a
L			
Ladders and ladderways, general	48, 49	1738	a-h
Ladders: Inclined	48, 49	1738	e-g
Rungs	48	1738	a, b
Vertical	49	1738	f
Width	48	1738	a
Ladderway compartments, single shaft	40, 41	1724	a
Ladderway, hand holds	49	1738	e
Lagging, square-set stopes	47	1735	a
Lamp sockets, electric	95	1768	a
Laws. See Act.			
Leasers, application of orders	8	1700	o
Lighting and candles	50, 51	1740	a-d
Lighting circuits, electric, insulation	91	1765	i
Lighting, electric, general orders	95	1768	a-e
Lighting, transformer rooms	88	1764	g
Lightning arresters, electrical	90	1765	d
Lights at stations	51	1740	b
Lights, electric, failure	86	1763	g
Lights, electric, protection	95	1768	e
Lights required on moving trains	96	1772	e
Lines, electric, above ground	90	1765	d
Loading, placing of primer cartridge	68	1745	j
Locomotives, underground, burning fuel	52	1741	d
Low voltage, definition	82	1760	d
M			
Machinery, lighting	51	1740	c
Machinery, stairs, etc., guard rails required	31, 32	1715	a
Machines and tools, removed before explosives delivered	67	1745	i
Magazines: Act	55, 56	1742	3
Competent men in charge	22	1708	b
Construction, large and small, act	56, 57	1742	3
Firearms prohibited	60	1742	13
Fire protection	63	1743	m
General	61, 62	1743	b, d, g
Near inflammable substances	64	1743	o
Smoking prohibited	64	1743	o

	Page	Order	Subdivision
Magazines and powder boxes locked, act	55	1742	3a
Magazines and powder boxes locked, general	61	1743	b, c
Manways, cleaning obstructions	44	1729	a
Maps, electric system	86	1763	h
Maps of abandoned mine must be filed	17	1705	b
Maps of mine workings must be made	16, 17	1705	a
Materials, first-aid	11, 12	1703	a, b
Material, inflammable, near mine openings	53	1741	g
Mechanical haulage, blocking of frogs required	96	1772	a
Mechanical haulage, employees riding on cars prohibited	96	1772	b
Mechanical haulage, refuge places	46	1733	a, b
Medium voltage, definition	82	1760	c
Men, number, definition	6, 7	1700	k
Men, number to ride on cage	68	1746	b
Metal receptacles for waste	53	1741	i
Mineral, definition	6	1700	d
Mine bells signals, general	79–81	1758	a–f
Mine, definition	5	1700	c
Mine exits, act	37, 38	1721	1, 2
Mine foreman. See Foreman.			
Mine foreman, definition	6	1700	g
Mine maps must be filed upon abandoning mine	17	1705	b
Mine maps must be made	16, 17	1705	a
Mine openings, removal inflammables	53	1741	f–h
Mine openings through other mines	39, 40	1723	a, b
Mine rescue apparatus: General	13	1704	a
Monthly inspections	15	1704	e
Monthly practice	16	1704	g
Number of trained men	16	1704	g
Physical examination for men	16	1704	h
Reports	15	1704	f
Mine rescue cooperative station	13, 15	1704	a–f
Mine rescue stations, supplies	15	1704	d
Mine superintendent. See Duties.			
Mine telephone required, act	78, 79	1755	1, 2
Mine timber required	44	1730	a–c
Mine ventilation	42	1726	a, b
Miners, timber supply	44	1730	b, c
Miners, to timber working places	44	1730	a
Mines, telephones, tunnels and adits	79	1756	--
Mining engineer, definition	6	1700	i
Missed holes, extraction explosives	30	1713	12
Missed holes, reported	30	1713	14

	Page	Order	Subdivision
Missed holes, reports, compulsory	65	1745	b
Monthly fire drills required	27, 28	1712	k
Monthly inspections, mine rescue apparatus	15	1704	e
Monthly practice, mine rescue apparatus	16	1704	g
Motors, electric grounding	85	1763	a
Motors, electric, protection	94, 95	1767	a
N			
Naphtha, storage	51, 52	1741	a-d
Notification, dangerous conditions	17, 18	1706	a, b
Notice: Designation for service	10, 11	1702	a-c
Electrical installation, required	83	1761	a
Fatal accidents	20, 21	1707	--
Hoisting, posting	73	1749	13
Prohibiting use of dangerous machine	19	1706	c
Rate of burning fuse	64	1744	b
Speed of hoisting	68	1746	a
To be filed with Commission	10	1702	a
Number of trained men required for mine rescue apparatus	16	1704	g
O			
Obstructions in escapeways	39, 40	1723	a
Obstructions in manways	44	1729	a
Oiling safety catches	77	1752	a
Oiling sheave wheels	78	1752	b
Oil, storage	51, 52	1741	a-c
Oil, underground supply	52	1741	c, d
Oily waste underground	53	1741	i
Open cut workings	5	1700	c
Openings, dangerous, abandoned, act	30, 31	1714	1, 2
Openings, mine, inflammables near	51-53	1741	a, b, g, h
Openings, platforms	49	1738	d
Openings: Protected underground	45	1731	a, b
Removal of protection by underground men prohibited	29	1713	7
Stopes, protection	47	1735	a
Through abandoned mines, upkeep	40	1723	b
Through other mines	39, 40	1723	a, b
To surface, act	37, 38	1721	1, 2
To surface, two required	38, 39	1722	a-c
Operator, definition	6	1700	e
Operator, duties. See Duties.			

	Page	Order	Subdivision
Orders: Air pressure tank	96	1770	a
Boiler safety	101, 102	1774	--
Electrical, general	82–96	1760–1767	--
Engine safety	97-101	1773	100-111
For underground men	28–30	1713	1–18
For underground men to be posted on bulletin boards	28	1713	--
General safety	96	1769	--
Woodworking safety	103	1776	--
Orehouses, dust allayed	50	1739	d
Organization of safety committees	23, 24	1708	d
Outlets, closing, communicating	39, 40	1723	a, b
Outlets, not to be covered by inflammable houses	41, 42	1725	a, b
Outlets, provisions affecting mines having only one	40, 41	1724	a
Outlets to surface, two required	38, 39	1722	a–c
Overwinding safeguards	73, 74	1749	a–c
Oxygen in mine air	42	1726	b
Oxygen mine rescue apparatus, duty of operator	13	1704	a

P

Passageways around shaft at station	46	1732	c
Passageways, electrical conductors	88	1764	d
Passageways, electrical switch boards	87, 88	1764	b–d
Penalty, state explosives act	56, 57	1742	4
Permit, strangers or visitors at mines	27	1712	e
Person, definition	7, 8	1700	m
Physical examination required for hoist engineers	70	1747	a
Physical examination required for men trained with breathing apparatus	16	1704	h
Pillars, shaft safety	43	1727	a
Pits, definition	5	1700	c
Places refuge, in haulageway	46	1733	a, b
Platforms: In ladderways	48	1738	c
Ladder projections	49	1738	e
Openings	49	1738	d
Plan, electric system	86	1763	h
Plural numbers, definition	5	1700	b
Potential, definitions	82, 83	1760	a–f
Powder. See Dynamite and Explosives.			
Precautions, general safety	26–28	1712	a–k
Precautions, hoisting material, act	81	1758	e
Primers. See Explosives.			
Procedure of engineers if operators fail to follow instructions regarding dangerous conditions	18	1706	b

	Page	Order	Subdivision
Protecting men, shaft sinking	78	1754	a
Protection against water	46, 47	1734	a–c
Protection, openings, stopes	47	1735	a
Protection, shaft	45,46	1732	a–c
Protection, winzes, raises and openings	45	1731	a, b
Providing for mine exits, act	37, 38	1721	1, 2
Provisions affecting mines having only one outlet	40, 41	1724	a
Pump rooms, lighting	51	1740	c

R

Rails, guard, general	31, 32	1715	a
Rails, guard, shaft protection	45	1732	a
Rails, skip	69, 70	1746	c
Railings in square set stopes	47	1735	a
Raises approaching accumulations water	46	1734	a
Raises, protection	45	1731	a
Rate of burning of fuse, notice to be posted	64	1744	a, b
Recommendation, stenches in case of fire or "caveins"	28	1712	k
Refuge, places required	46	1733	a, b
Regulations provided for control of explosives, state act	54–60	1742	1–16
Repairs, shaft, hoisting engineer notified	46	1732	c
Reporting of unsafe conditions by employees	27	1712	d
Reports: Accidents and injuries by employees	26	1711	a
Accidents and injuries by operator	30	1713	15
Fatal injuries, by wire	19	1707	--
Fires, gas and inrush water	9, 10	1701	b
Mine rescue apparatus	15	1704	f
Missed holes, by firer	30	1713	14
Missed holes, compulsory	65	1745	b
On dangerous equipment required	22, 23	1708	b–c
Superintendent to operator	22	1708	b
To chief mining engineer yearly	8–10	1701	a–c
Unusual condition in working place	30	1713	17
Respirators and rock dust	49, 50	1739	a–d
Restraining dam, underground	96	1771	a
Rock or ground, method of testing for miners	29	1713	5
Roof inspection	43	1728	a, b
Rubbish, combustible	53	1741	f
Rungs in ladders	48	1738	a, b
Runway for carman required	32	1716	a

S

	Page	Order	Subdivision
Safeguards against overwinding, general	73, 74	1749	a-c
Safety bulletin boards required	28	1713	--
Safety catches, oiling and testing	77	1752	a
Safety catches on cages and skips	77	1752	a
Safety committees, organization	23, 24	1708	d
Safety factor of hoisting ropes	74	1750	a, b
Safety inspections, superintendent's duties	22	1708	b
Safety orders: Air pressure tank	96	1770	a
Boiler	101, 102	1774	--
Engine	97–101	1773	100–111
General	96	1769	--
Woodworking	103	1776	--
Safety pillars	43	1727	a
Safety precautions, general	26–28	1712	a-k
Sanitation act, labor camp, act	32–35	1717	1–8
Sanitation, dry closets, drinking water	36, 37	1720	a, b
Sanitation, dry or water closets	36, 37	1720	a
Screens guarded, moving	31	1715	a
Services of notices, designation	10	1702	a
Shaft: Electrical conductors in	92	1765	m
Fencing, act	31	1714	1–4
Hoisting, general	68–71	1746	a–f
Incline, skip tracks	69, 70	1746	e
Incline, special precautions	70	1746	f
Inspection reports, weekly	23	1708	c
Men riding on bail of skip	30	1713	18
Passageways around, at station	46	1732	c
Protection	45, 46	1732	a-c
Protection, sinking	78	1754	a
Repairs, hoisting engineer to be notified	46	1732	c
Retimbering, solitary employment forbidden	27	1712	h
Signal devices required	79	1757	a
Signaling, general orders	79	1757	a, b
Signaling, mine bell orders	79–81	1758	a-f
Signaling, telephone, act	79, 80	1755	1–2
Sinking, extension ladders required	49	1738	h
Sinking, hoisting precaution	78	1753	a
Sinking, use of electric exploders	68	1745	k
Stations, incline	70	1747	t
Stations, signal boards	81	1759	a
Stations, stationary lights	51	1740	b
Stoping near	43	1727	a
Vertical, hoisting	76, 77	1751	a, b
Vertical, safety catches for cage or skip required	77	1751	b

	Page	Order	Subdivision
Sheave wheels, inspected and oiled	78	1752	b
Sheaves, small, forbidden	75	1750	e
Sheds, timber framing	53	1741	g
Shift boss, duties, hoisting	68	1746	b
Shooting in shaft	80	1758	a
Shot firers, duties, blasting	65, 66	1745	a–e
Shot firing precautions, electricity	66, 67	1745	d, e, f
Signal boards at each station required	81	1759	a
Signal warning hoisting engineer	74	1749	c
Signaling. See Shaft.			
Signals, general	79	1757	a, b
Signs, bell signals	81	1758	f
Signs, hoisting, superintendent to post signs	68	1746	a, b
Signs, magazines, act	55, 56	1742	3a, b
Signs, speed of hoisting	68	1746	a
Singular and plural numbers, definition	5	1700	b
Sinking shaft, extension ladders	49	1738	h
Sinking shaft, hoisting precaution	78	1753	a
Sinking shaft, protection	78	1754	a
Skip: Construction, vertical shafts	76, 77	1751	b
Hoisting men, construction	76	1751	a, b
Hoisting men, special requirements	77	1751	c
Men riding on bail	30	1713	18
Number of men permitted	68	1746	b
Operation when sinking	76	1751	a
Skip pockets, passageways	46	1732	c
Skip tender, duties, closing gates	77	1751	d
Skip tender, duties, general	69	1746	c
Skip, testing safety catches	77	1752	a
Skip tracks, specifications	69	1746	e
Smoking in magazine, prohibited	64	1743	n
Solitary employment forbidden	26	1712	c
Special precautions, fuse	65	1744	h
Special signal boards required at each station	81	1759	a
Specifications, cages, hoisting	76	1751	b
Speed of hoisting men	68	1746	a
Spikes or nails, protection of projecting points	27	1712	g
Square set stopes, timbering and guarding	47	1735	a
Stairs guarded, required	31	1715	a
State act, fencing abandoned shafts	30, 31	1714	1–4
State act, hours of labor in mine, underground workings and smelter	102	1775	1–3
State act, telephone system in mines	78, 79	1755	1, 2
Stationary lights at stations	51	1740	b
Station signal board required	81	1759	a

	Page	Order	Subdivision
Stations, shaft protection	45	1732	a
Stenches, warning in case of a disaster, recommendation	28	1712	k
Stope, inspection required	43	1728	a
Stopes, protection of openings	47	1735	a
Stoping near shaft	43	1727	a
Storage of explosives, act	55, 56	1742	3
Storage and transportation, caps, explosives	62	1743	e-f
Storage and use of explosives, general	60-64	1743	a-o
Storage of explosives, escape of miners underground	60	1743	a
Storage of explosives in mine	61	1743	b
Storage of fuse underground	65	1744	h
Storage of inflammable material	51-53	1741	a-g
Storage of oil, general	51, 52	1741	a-c
Strangers or visitors at mines	27	1712	e
Strap iron, skip tracks	69	1746	e
Stretchers required	11-13	1703	a, b
Structures, inflammable	53	1741	g
Structures over escapeways	41, 42	1725	a, b
Superintendent, appointment required	21, 22	1708	a
Superintendent, definition	5	1700	f
Superintendent: Duties, see Duties.			
Duty to immediately report dangerous conditions	9, 10	1701	b
Experience required	22	1708	a
Safety inspections, reports	22	1708	a
Supplies, first-aid, required	11-13	1703	a, b
Supplies, mine rescue stations	15	1704	d
Switchboards, electrical, live metal work	88	1764	e
Switchboards, specifications, electrical	85	1763	d
Switches, electric	94	1766	b-e

T

Tamping powder with sticks	30	1713	11
Tamping rods, wooden required	65	1745	a
Telegraphic reports, fatal injuries	20	1707	53
Telephone communication, cooperative mine rescue station	15	1704	e
Telephone system in mines, state act	78, 79	1755	1, 2
Telephones in mines, tunnels and adits	79	1756	--
Tender, cage, must close gates	77	1751	d
Terminals, electrical, protection	88	1764	f
Testing safety catches	77	1752	a
Tests, mine rescue apparatus	15	1704	f

	Page	Order	Subdivision
Thawing dynamite	62, 63	1743	h, i
Timber framing sheds near mine openings	53	1741	g
Timber in manways, cleaning	41	1729	a
Timber in stopes	47	1735	a
Timber, miner to use	41	1730	a
Timber, operator to supply	41	1730	a–c
Timber, tools, etc., must be securely lashed to cable, hoisting	81	1758	e
Timber, waste, underground	53	1741	f
Timber, working places	44	1730	a
Timbering, general	41	1730	a–c
Toilets, operator to provide	36, 37	1720	a
Toilets, sanitation act	33	1717	4
Tools, hoisting	81	1758	e
Tracks, skip, wooden	69	1746	e
Trained men, mine rescue apparatus	16	1704	g
Trains in motion, lights required	96	1772	e
Transformer rooms, construction, lighting	88	1764	g
Transformers, electrical, protection	89	1764	h
Transmission lines and cables	88–93	1765	a–s
Transportation, general	96	1772	a–c
Trestles, guarded required	31	1715	a
Tributers, application of orders	8	1700	o
Trolley wires, protection	91, 92	1765	j, k
Tunnels, telephones required	79	1756	--
Two openings to surface required	38, 39	1722	a–c

U

Underground, definition	8	1700	n
Underground men, orders	28–30	1713	1–18
Underground restraining dam, approval for construction required	96	1771	a
Underground stations and transformer rooms, electrical	87–89	1764	a–h
Underground storage of carbide	51	1740	d
Underground trolley wires, protection	91, 92	1765	j, k
Unsafe condition in mine, engineer's procedure	17, 18	1706	a, b
Unsafe conditions to be reported	27	1712	d
Unsafe machinery, method of preventing use	18, 19	1706	c
Use of unsafe machinery, how prevented, injunction	18, 19	1706	c

V

	Page	Order	Subdivision
Ventilating shaft, inflammable covers	53	1741	g
Ventilation, act	33	1717	2
Ventilation, mine required	42, 43	1726	a-c
Vertical ladders	49	1738	f
Vertical shaft, cage construction	76, 77	1751	a, b
Vertical shafts, safety catches for cage or skip required	77	1751	b
Violation of orders reported to foreman	24, 25	1710	a
Violation of safety orders, injunction	18, 19	1706	c
Visitors at mine require permits	27	1712	c
Voltage, definition	82, 83	1760	a-f
Voltage, electrical, underground	85	1763	b

W

Walks guarded, dangerous plank	31	1715	a
Warnings given when blasting	65	1745	a
Warning signals, hoisting engineer	74	1749	c
Waste dump tracks	32	1716	a
Waste, oily, underground, removal	53	1741	i
Waste timber underground, removal	53	1741	f
Water closets required	36	1720	a
Water, drinking act	36	1719	--
Water proofing, fuse	64	1744	c
Water, protection against	46, 47	1734	a-c
Weekly inspection, shaft	22, 23	1708	c
Whims, safeguards	47	1736	a
Winzes, raises and openings, protection	45	1731	a, b
Wires, electric lighting circuits	91	1765	i
Wires, electrical, protection and support	89-94	1765	a-s
Wooden structures near shafts	53	1741	g
Woodworking safety orders	103	1776	--
Working alone forbidden	26	1711	c
Working places timber	44	1730	a
Workings and excavations definition	6	1700	j
Workings must be shown on mine maps	16, 17	1705	a
Workings protection against water	46, 47	1734	a-c
Workmen's Compensation, Insurance and Safety Act, Appendix	103	----	--

O

6163 11-20 5,000

LIBRARY OF CONGRESS
0 002 949 806 4